



## 4

# Growth in Reading Proficiency over Time

This chapter examines improvements in reading proficiency observed between the ages of 15 and 24 and determines whether they meet, exceed or fall short of expectations. For example, PISA-15 and PISA-24 show that approximately 59 score points were gained annually while students remained in formal education, but that the level of reading proficiency at age 24 was lower than that estimated for students at the end of compulsory education. This suggests that skills gains do not continue at the same annual rate as measured in 2000 when students were 15. Skills acquisition in PISA-24 is then analysed within the PISA reading framework.



## HOW DO YOUNG PEOPLE'S READING SKILLS EVOLVE AFTER COMPULSORY EDUCATION?

Although reading proficiency improved among nearly all Canadian youth, as represented by participants in PISA-24, the rate of growth was not necessarily constant between the ages of 15 and 24. Rather, the rate of skills growth was influenced by the life transitions that occurred during this time. This chapter analyses these learning gains in greater depth, providing a conceptual framework for the analysis of skills growth. The chapter also explores skills growth within the PISA reading framework, and analyses the various patterns of skills acquisition across contexts, text structures, and reading processes.

PISA-15 data provides a frame of reference for the evidence on skills growth in PISA-24. The PISA population is defined as 15-year-olds in education, regardless of the grade in which they are placed and regardless of why they might be in different grades. Comparing student performance across adjacent grades, with some technical adjustments, provides a measure of expected skills growth as students progress from one grade to the next.

Combining data from PISA-15 and PISA-24, the rate of growth expected from regular grade progression (measured using PISA-15) is compared to actual reading proficiency measured at age 24 (measured using PISA-24 and PISA-15). This comparison can provide some insights into the dynamic nature of skills gain and loss. For example, does the skills growth observed in PISA-24 measure up to the skills growth predicted using grade projections from PISA-15?

As young people move from grade to grade, and from education to work, the types and complexity of materials that they are required to read and understand also change. PISA assesses overall reading skills within an array of contexts and texts types. By comparing differences in performance among the kinds of questions used in PISA, it is possible to analyse how improvements in reading proficiency vary depending on these contexts and types of texts.

### GRADE PROGRESSION AND GROWTH IN READING SKILLS

At the time of the PISA-15 test, participating students were enrolled in different grades. Most of the students were enrolled in grade 10, but some were enrolled in grades 9, 8 and 7 and a few of them were enrolled in grades 11 and 12.

There are various explanations for these differences. For example, the month of birth determining the age of entry into school, and the rules determining the normal progression through grades, vary from province to province; so even though all students were 15 at the time of the first PISA test, they were enrolled in different grades. The analysis presented here adjusts for differences between regions and for students of various ages.

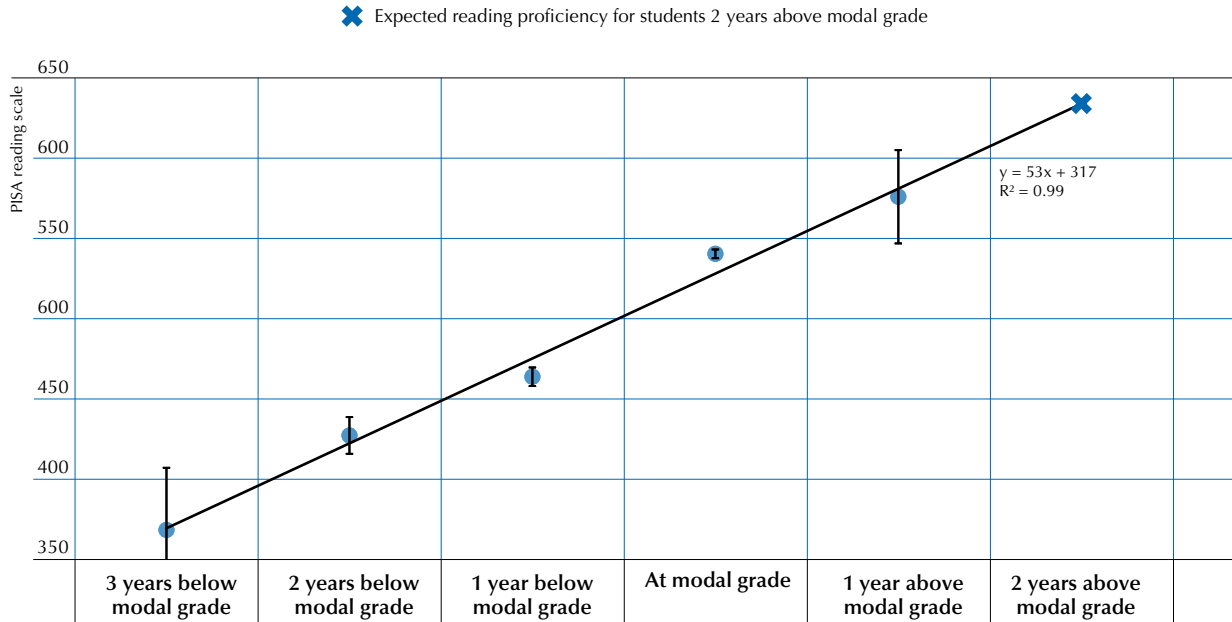
Figure 4.1 illustrates the relationship between years in school and reading proficiency. The horizontal axis represents the relative grade of each student. This is calculated by subtracting the actual grade of each student from the most common grade of students in the same province who were born in the same month (the modal grade in that province has the value zero on the horizontal axis). For example, if the student is in grade 9 and the modal grade among respondents from his or her province is grade 10, then the relative grade of this student will be minus one. The horizontal axis begins three grades below the modal grade, as this is the lowest relative grade observed in PISA-15. Secondary education in Canada provides at least 11 years of formal education and in most cases 12 years.<sup>1</sup> Therefore, the horizontal axis in Figure 4.1 ends two units above the modal grade because most students who were in the modal grade when they took the PISA exam at age 15 could expect to receive an additional two years of formal education, not counting any post-secondary education.

The vertical axis in Figure 4.1 shows the relative PISA score in reading. This score is relative to the average proficiency of students of the same age in the same province, in order to control for differences in average proficiency by province and month of birth.<sup>2</sup> Each of the dots along the resulting data co-ordinates of grade and proficiency represents the estimated relationship between years of schooling and reading proficiency. The solid line describes the linear relationship between grade level and average performance. This “line of best fit” minimises the distance between each of the points and the line; in other words, it is the closest line to all points. As such, the line, or more precisely, its slope, represents the best possible approximation of a measure of expected skills growth associated with grade progression. The slope of the line of best fit is approximately 59, indicating that each year of education is associated with a learning gain of 59 score points on the PISA scale.<sup>3</sup>

Assuming there is no development, either gain or loss, in skills after the end of compulsory education, one implication of the results presented in Figure 4.1 is that young people who progressed through secondary education should have an average reading proficiency of about 640 score points. This score represents the predicted average performance of students two grades above the modal grade in their region.



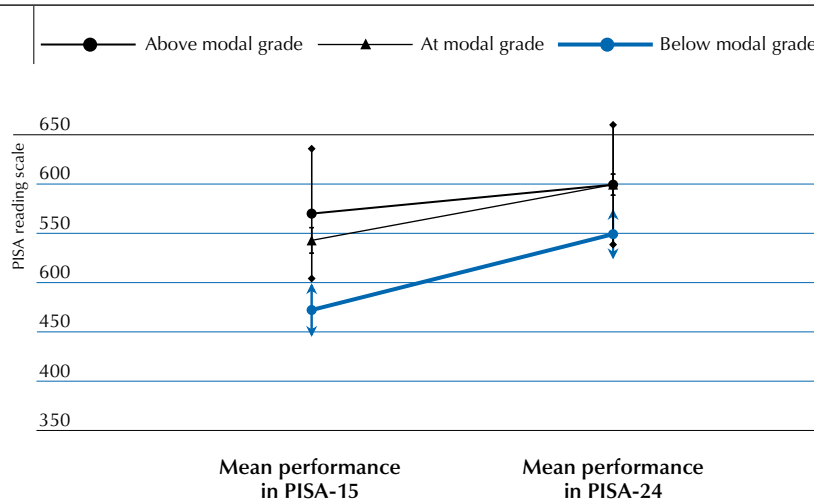
■ Figure 4.1 ■  
**Relative grade level and average reading proficiency at age 15**



Source: Table 4.1; YITS cycle 5.5: Reading Skills Reassessment.  
 StatLink <http://dx.doi.org/10.1787/888932576814>

However, PISA-24 paints a very different picture. Figure 4.2 depicts the actual evolution of skills between 2000 and 2009, by relative grade, for three groups of students: students above the most common grade in 2000; students at the most common grade; and students below the most common grade.

■ Figure 4.2 ■  
**Comparison of reading performance in PISA-15 and PISA-24, by relative grade at age 15**



Note: The vertical lines on each measure of mean performance indicate the degree of precision with which these average scores are calculated. In statistical terms, the range of performance covered by these lines is referred to as the confidence interval. In general, overlapping vertical lines (joined confidence intervals) suggest that the differences are not statistically significant with a high degree of confidence.

Source: Table 4.1; YITS cycle 5.5: Reading Skills Reassessment.  
 StatLink <http://dx.doi.org/10.1787/888932576814>



The group of students below the most common grade was the group with the lowest average score in PISA-15 and the fastest rate of skills acquisition between 2000 and 2009. On average, those 15-year-old students below the most common grade averaged 472 points in PISA-15 compared to 543 points for the group in the most common grade, and 570 points for the group above the most common grade. By the time these students were 24, those who had been below the most common grade at 15 still had the lowest average score (549 points), while there was virtually no difference between those who had been at or above the modal grade when they were 15 (599 points for both groups). Yet those below the modal grade showed the fastest rate of growth in reading skills. The average score among this group improved by almost 77 score points – more than an entire proficiency level. In contrast, the average score among those who were above the modal grade when they were 15 improved by less than 30 points. This is shown in Figure 4.2 by the two converging lines, which indicate a loss of advantage for students who were initially in higher grades.

By the age of 24, the level of reading proficiency among all three groups is below that predicted by the relationship between skills and grade progression (Figure 4.1). After two or more years in compulsory education and a number of years either in the labour market or in post-secondary education, the average score among these groups is below the predicted 634 points.

This evidence suggests that reading proficiency develops more slowly after formal schooling, and that loss of skills could begin before the age of 24. However, by the age of 24, most young people will have specialised in a particular field, and general reading proficiency will have ceased to be the goal of their education and training.

### DYNAMIC LEARNING IN THE CONTEXT OF THE PISA READING FRAMEWORK

Since PISA-24 shows evidence of widespread skills gains, it is difficult to identify the specific reading skills that are subject to deterioration over time. One possibility is that reading proficiency may be improving or deteriorating depending on the type of texts read.

During late adolescence, as young people focus on more specialised learning, the brain becomes more efficient in performing tasks that are done more frequently, while it also becomes less efficient in functions that are infrequently used.<sup>4</sup> For proficiency in reading, the context of reading and the type of texts read become important factors influencing growth and decline.

As discussed in Chapter 2, the PISA reading framework groups assessment questions into three main categories: context, text structure and reading process (Adams and Wu, 2002). Since many of the questions in the PISA-15 were also used in PISA-24, it is possible to compare the relative performance on each test question across individuals. The analyses presented here describe patterns of performance taking into account the difficulty of the questions. Annex A provides details on the methodology underpinning this analysis.

A number of examples of PISA reading units and questions are presented at the end of this chapter. The units, and the questions within each unit, are not those selected for inclusion in PISA-24, as these are used to anchor other questions and construct trends within PISA, and therefore represent confidential material; but they do provide examples of the differences across contexts, text structures and reading processes assessed in PISA. They also exemplify how, for example, context and text structure interact with one another, or the differences between reading process and text structure.

The PISA reading framework distinguishes four levels within the “context” dimension of reading proficiency: educational, occupational, personal and public. In the “text structure” dimension, there are two levels: continuous and non-continuous. In the “reading process” dimension, there are three levels: retrieving, interpreting, and reflecting on information. Sample PISA test questions are included at the end of this chapter. The question entitled “brushing your teeth” is an example of a continuous, educational, interpreting question. “Mobile phone safety” is an example of a non-continuous, public, interpreting question. These examples cover all these dimensions and illustrate how they are used in the actual PISA test.

The proportion of students who answered a question correctly provides a simple way to analyse performance on a particular question, or group of questions. This is referred to as the item-correct score expressed on a scale of zero to one for each item.<sup>5</sup> Table 4.2 in Annex B provides details on item-correct scores for each of the 28 questions that appeared in PISA-15 and PISA-24.

The difference between the item-correct score in PISA-24 and the item-correct score in PISA-15 shows whether respondents improved or not on a particular question in the nine years between tests. The average difference for a group



of questions shows whether there was improvement on a particular type of question, for instance, if questions of a similar context showed more or less improvement than other types of questions.

The more difficult the question, the smaller the proportion of students who answered it correctly in PISA-15, thus the more room for improvement by the time of the PISA re-assessment in 2009. For this reason, the more difficult questions may provide greater insight as to how skills growth varied across the PISA dimensions. The analysis presented here first looks at patterns of improvement and then relates those to the difficulty of the questions.

### Improvements in performance across question types in the PISA reading framework

Figure 4.3 shows the average difference in item-correct scores for each level of the questions. In other words, it is the average improvement between PISA-15 and PISA-24 on questions categorised by their context, text structure and reading process. These are displayed in the box on the right vertical axis. The bars in Figure 4.3 show the proportion of questions in which there was an improvement and the proportion in which there was no change. This provides complementary evidence to the average difference.

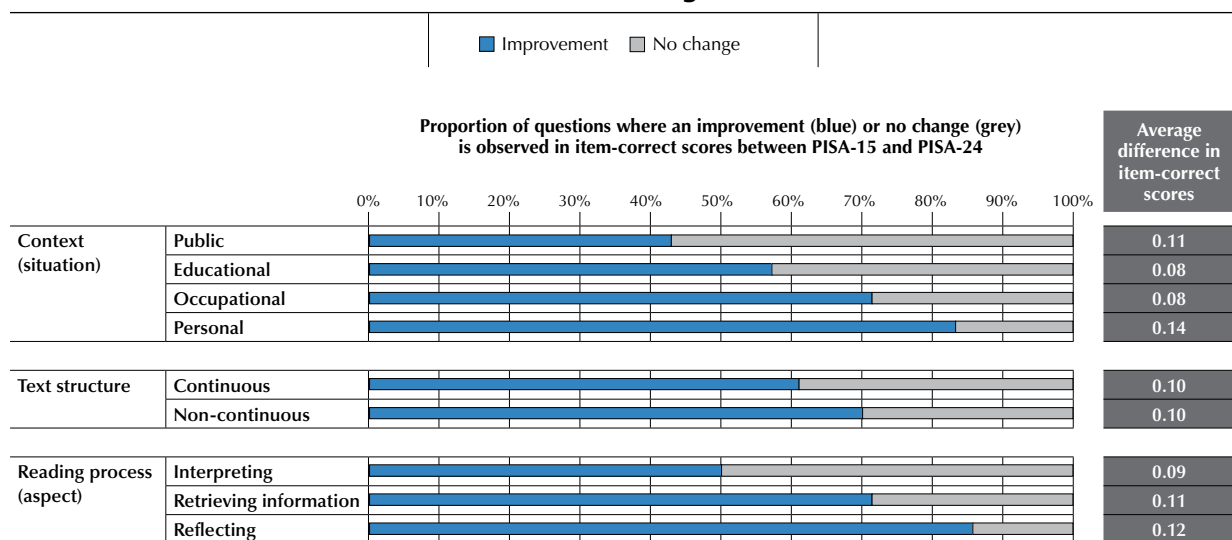
All dimensions assessed by PISA showed significant improvement between 2000 and 2009. The average change in item-correct score was 0.10. However, as Figure 4.3 indicates, the change in proficiency is not uniform across the cognitive dimensions that comprise the reading domain. Average change varied from a low of 0.08 to a high of 0.14.

Of the four types of contexts represented in the PISA questions, the average difference is largest for those related to personal contexts. This is also the context that had the largest proportion of questions showing an improvement. Questions in the education and occupation contexts showed the smallest average differences. These are the contexts most often referenced by texts encountered in formal education, so it is not surprising that improvements in skills were smaller on these questions, as most young people would have left formal education well before the age of 24. Finally, the average item-correct difference for PISA items related to the public context was around the average. Although this context had the smallest proportion of questions showing improvements, the improvements on these questions tended to be greater. These average changes need to be interpreted with caution as they hide differences across groups of individuals who have followed different education and labour-market pathways.

Surprisingly, given the relative balance of text structures in various environments, there is little difference between the improvements in average performance on questions involving continuous versus non-continuous text structures. However, a slightly larger proportion of questions related to non-continuous texts showed improvement compared to continuous texts.

■ Figure 4.3 ■

#### Improvements between PISA-15 and PISA-24, by question type within the PISA reading framework



Source: Table 4.2; YITS cycle 5.5; Reading Skills Reassessment.

StatLink <http://dx.doi.org/10.1787/888932576814>



Questions categorised by the reading process of reflecting showed the largest gain among the three levels of this dimension. It also had the largest proportion of questions that showed improvements. Questions categorised as reflecting require individuals to relate texts to their own conceptual and experiential frames of reference. Since young people have gained considerable life experience in the nine years between 15 and 24 it is not surprising to see greater improvements in this process. Questions requiring retrieval and interpretation did not show as large an improvement.

## Question difficulty and improvements in performance

### **Contexts: Personal, occupational, public and educational**

Taking the difficulty of the questions into account, skills gains appear more frequently in questions framed in a personal context and less frequently when framed in an educational context. Skills gains are more mixed for questions framed in occupational and public contexts. These findings show that individual experience plays an important role in skills gains after compulsory education. While there is no evidence of skills loss among the questions in the educational context, performance improvements tend to be smaller and less frequent in this area.

Questions framed in a personal context are found along the entire spectrum of difficulty, and improvements in item-correct statistics are relatively larger among these questions than among other types of questions (Table 4.2).

The evidence of skills growth among questions framed in occupational contexts is somewhat weakened after taking into account the difficulty of the questions. In both PISA-15 and PISA-24, these types of questions tended to be of average difficulty. While, in general, the more difficult the question, the greater the improvement observed, very little improvement is seen in one relatively difficult question (Employment, Question 2 or R219Q01T). Questions framed in a public context are distributed along the entire range of difficulty in PISA-24. Above average improvements in item-correct scores are observed among difficult questions. Slightly below-average improvements are seen on questions of average difficulty; and there are no or only slight improvements on easy questions in this context (Table 4.2).

Improvements on questions framed in an educational context are minimal. With the exception of educational questions in the middle range of difficulty, the improvements observed between 2000 and 2009 are smaller than average, given the difficulty of the questions. There are small improvements on the easier questions in this context, as would be expected, although there are questions of similar difficulty that show more marked improvement. Improvements on the difficult questions in this context are particularly small. The item-correct scores are the lowest among questions of similar difficulty among all four contexts (Table 4.2).

### **Text structure: Continuous and non-continuous texts**

The only appreciable difference between the questions involving continuous and non-continuous text is found among the most difficult questions of each type. For non-continuous text questions, the observed improvements between 2000 and 2009 are large and greater than average, given their difficulty level. For continuous text questions, the improvements are not as large, and in some cases they are smaller than average, given their difficulty (Table 4.2).

### **Reading process: Reflecting on texts, interpreting texts, retrieving information**

Results from PISA-24 do not show faster or slower rates of skills acquisition for any one of the three types of reading processes examined after question difficulty is taken into account. This suggests that skills growth is similar across all three reading processes.

The overall improvements observed for reflecting on texts and, to a lesser extent, for retrieving information, appear to depend partly on the difficulty of the questions. There is only one easy question related to reflecting on texts in PISA-24, which might explain why there are more of these types of questions that show improvements in item-correct scores than other types of questions: the more difficult the question, the larger the improvement over time tended to be. Yet, the observed improvements on these difficult reflecting questions are relatively weak and smaller than the improvements observed on questions related to the other reading processes.

For the reading process involving retrieving information, the results on item-correct scores are equally mixed. There are two relatively difficult questions related to retrieving information. On one, the observed improvements in item-correct scores are large – in fact, slightly larger than average. But on the other, the opposite is true: there is basically no noticeable improvement. The same mixed pattern is observed on easy or moderately difficult questions related to the same reading process (Table 4.2).



The questions related to interpreting texts span the whole range of difficulty in PISA-24, and the observed improvements in item-correct scores largely correspond to the difficulty of each question. The only deviations from this norm are the two most difficult questions related to this process, where observed improvements are particularly large—larger, for example, than those on questions of similar difficulty related to reflecting on texts (Table 4.2). It is possible that these differences are related to the context in which these questions are asked. In fact, the difficult interpreting questions are posed on personal contexts, whereas the reflecting questions are posed on an educational context.

#### Box 4.1 Perceived and actual reading loss

Text structure appears to have a strong association with how individuals perceive their reading proficiency. For example, Canadian youth who took part in PISA in 2000 and who were followed longitudinally in YITS were asked to rate their own reading proficiency at each data collection every two years. Using these data for the PISA-24 sample, a small number of respondents (only 61 participants report a perceived loss of skills) rated their reading skills lower in 2009 as compared with 2000. The question performance of these respondents is compared with that of other respondents who did not perceive some loss of skills (Table 4.2). In fact, neither group showed a skills loss; both groups had net improvements in their performance on questions in almost all classifications of questions.

However, there are differences in performance on questions between those who perceived a skills loss and those who did not, depending on structure of the text. For those who had not perceived a skills loss, there are variations across reading processes (retrieving, interpreting and reflecting) in continuous texts but not in non-continuous texts. For continuous texts, performance improvements are greater in retrieving information and reflecting on texts than for interpreting, perhaps because of differences in the purpose of reading in adult contexts between reading for pleasure and reading to acquire specific information.

The differences are even more pronounced for the group who perceived a skills loss. Although there is no such decline evident, there is relative stagnation in performance on questions involving continuous texts compared with those involving non-continuous texts. Similarly, across text types, questions requiring reflecting processes also have relatively smaller improvements in performance. In contrast, performance on questions requiring interpretation of non-continuous texts improved substantially. These results suggest that the nature of “reading proficiency” may be narrowly defined in popular understanding, related to the specific activities associated with the construction of meaning from continuous texts.

## CHAPTER SUMMARY AND CONCLUSIONS

PISA-15 provides a framework for analysing skills gains in at least two respects. First, performance differences across grades allow researchers to estimate skills acquisition resulting from students’ progress through compulsory education. Given that most students had completed secondary education by age 24, this estimate of skills growth provides a baseline from which to measure the development of skills between the ages of 15 and 24. Second, skills acquisition is analysed along the different building blocks of the PISA reading framework. By analysing performance on specific questions across assessments, it is possible to study, for example, if the overall skills acquisition evident in PISA-24 hides variations across the different aspects covered by the PISA reading assessment.

By examining the grades in which 15-year-old students were placed when they took the PISA-15 test, it is estimated that students gained around 59 score points in each year of compulsory education. This is a notable increase, equal to nearly three-quarters of a proficiency level. Reading proficiency at age 24 was, in fact, poorer than it was projected to be among students at the completion of compulsory education (grade 12 or two additional years for most PISA-15 participants).

Results from PISA-24 suggest, therefore, that skills gains do not continue at the same rate as measured at age 15. Not only was the development of reading proficiency slower after the completion of compulsory education, it appears likely that skills loss could have begun prior to age 24. These results also point to the possibility that compulsory schooling is effective in improving reading proficiency and therefore suggest that efforts should be targeted at those students who are likely to drop out of school.



Using the PISA reading framework as a reference, PISA-24 provides evidence that skills growth and maintenance occur in specific contexts and depend on individual experiences. As the contexts in which individuals use their reading skills change when they move from compulsory education into the labour market or continue with their education, it is only natural that the pace and type of learning change as well. Between the ages of 15 and 24, development of language skills was most evident in personal contexts and least evident in educational contexts. It is possible that as youth moved out of compulsory education it is in this context that reading skills have experienced the lowest amount of skill use. The findings on skills improvement related to text structure is more nuanced, as there is only weak evidence of faster skills growth in non-continuous text questions as compared with continuous text questions. The reading process of reflecting appears to have improved the most, but differences among the reading processes were quite small.

A key factor in the dynamic process of learning is the use of reading in daily life. Overall, the patterns of improvements in reading proficiency show that using reading skills regularly is a strong determinant of learning gain. While improvements in proficiency were widespread between the ages of 15 and 24, some evidence suggests that reading proficiency among young adults may already be in decline. For example, PISA-15 and PISA-24 show that approximately 59 score points were gained annually while students remained in formal education, but that the level of reading proficiency at age 24 was lower than that estimated for students at the completion of grade 12. Even after taking into consideration that PISA was not designed with to test skills at age 24, this evidence suggests that the acquisition of skills does not continue at the same annual rate as measured in 2000 when students were 15.

Substantial skills growth is apparent in each of the main dimensions considered in the PISA reading framework (context, text structure and reading process), but the rate of change in proficiency is not uniform across these key dimensions. For example, larger gains were made on reading questions related to personal, rather than educational, contexts, due to the completion of compulsory education for most people between the ages of 15 and 24.

This evidence confirms the importance of reading activities to maintain and ensure high levels of proficiency into adulthood, and supports earlier evidence from the International Adult Literacy Survey that showed that a decline in skills may begin quite early in adult life.

### EXAMPLES OF PISA READING UNITS

The following questions are presented in the order in which they appeared within the unit in the main survey. Percentages of student responses are not provided in the tabulation of framework characteristics (as they were in the parallel material in the 2006 international report) because several of the units were only administered by some of the countries, and the comparison of percentages between questions in those units and other units might lead to a misinterpretation of task difficulty.





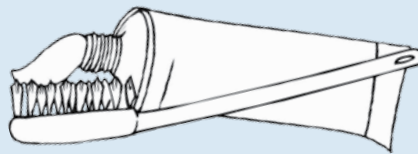
■ Figure 4.4 ■

**BRUSHING YOUR TEETH**

Do our teeth become cleaner and cleaner the longer and harder we brush them?

British researchers say no. They have actually tried out many different alternatives, and ended up with the perfect way to brush your teeth. A two minute brush, without brushing too hard, gives the best result. If you brush hard, you harm your tooth enamel and your gums without loosening food remnants or plaque.

Bente Hansen, an expert on tooth brushing, says that it is a good idea to hold the toothbrush the way you hold a pen. "Start in one corner and brush your way along the whole row," she says. "Don't forget your tongue either! It can actually contain loads of bacteria that may cause bad breath."



"Brushing your Teeth" is an article from a Norwegian magazine.

Use "Brushing Your Teeth" above to answer the questions that follow.

**BRUSHING YOUR TEETH – QUESTION 1**

**Situation:** Educational

**Text format:** Continuous

**Text type:** Exposition

**Aspect:** Integrate and interpret – Form a broad understanding

**Question format:** Multiple choice

**Difficulty:** 353 (1a)

698	Level 6
626	Level 5
553	Level 4
480	Level 3
407	Level 2
335	Level 1a
262	Level 1b
	Below Level 1b

What is this article about?

- A. The best way to brush your teeth.
- B. The best kind of toothbrush to use.
- C. The importance of good teeth.
- D. The way different people brush their teeth.

**Scoring**

**Full Credit:** The best way to brush your teeth.

**Comment**

This task requires the reader to recognise the main idea of a short descriptive text. The text is not only short, but about the very familiar, everyday topic of brushing one's teeth. The language is quite idiomatic ("loads of bacteria", "bad breath"), and the text is composed of short paragraphs and familiar syntactic structures, with a straightforward heading and a supporting illustration. All of these features combine to make the text very approachable.

The difficulty of this question is located towards bottom of Level 1a, among the easier PISA reading questions. The question stem is rather open and broad, directing the reader to look for a broad generalisation as an answer. The words of the key ("The best way to brush your teeth") include a term that is part of the title ("brush(ing) your teeth"), and if – drawing on knowledge about the conventional structures and features of texts – there is an expectation that a title is likely to summarise a text, the reader need go no further than the title to find the key. Should confirmation be sought, the first three sentences of the body of the text also encapsulate the main idea, and it is repeated by illustration and elaboration in what little remains of this short piece. Thus the required information is both prominent and repeated in a short and simple text: all markers of relatively easy reading tasks.



## BRUSHING YOUR TEETH – QUESTION 2

**Situation:** Educational

**Text format:** Continuous

**Text type:** Exposition

**Aspect:** Access and retrieve – Retrieve information

**Question format:** Multiple choice

**Difficulty:** 358 (1a)

698	Level 6
626	Level 5
553	Level 4
480	Level 3
407	Level 2
335	Level 1a
262	Level 1b
	Below Level 1b

What do the British researchers recommend?

- A. That you brush your teeth as often as possible.
- B. That you do not try to brush your tongue.
- C. That you do not brush your teeth too hard.
- D. That you brush your tongue more often than your teeth.

### Scoring

**Full Credit:** C. That you do not brush your teeth too hard.

### Comment

Another question located at Level 1a, this task requires readers to retrieve a specific piece of information from the text rather than recognise a broad generalisation (as in the previous task); the question is therefore classified as **access and retrieve** by aspect. The task explicitly directs the reader to the second paragraph with the literal match to “British researchers”. It nevertheless requires some synthesis and some inference, to understand that the British researchers referred to at the beginning of paragraph 2 are those giving the advice throughout the paragraph, and that “gives the best results” is synonymous with “recommend”. Performance on this task showed that the distractor providing most competition for the key is the first one, “That you brush your teeth as often as possible”, presumably because it draws on a plausible misconception based on prior knowledge.

## BRUSHING YOUR TEETH – QUESTION 3

**Situation:** Educational

**Text format:** Continuous

**Text type:** Exposition

**Aspect:** Access and retrieve – Retrieve information

**Question format:** Short response

**Difficulty:** 285 (1b)

698	Level 6
626	Level 5
553	Level 4
480	Level 3
407	Level 2
335	Level 1a
262	Level 1b
	Below Level 1b

Why should you brush your tongue, according to Bente Hansen?

.....

.....

### Scoring

**Full Credit:** Refers either to the bacteria OR getting rid of bad breath, OR both. Response may paraphrase or quote directly from the text.

- To get rid of bacteria.
- Your tongue can contain bacteria.
- Bacteria.
- Because you can avoid bad breath.
- Bad breath.
- To remove bacteria and therefore stop you from having bad breath. [both]
- It can actually contain loads of bacteria that may cause bad breath. [both]
- Bacteria can cause bad breath.



### Comment

The wording of the question provides two terms that can be used literally to find the relevant section of the text: “Bente Hansen” and “tongue”. Moreover, the term “Bente Hansen” occurs in a prominent position at the very beginning of the last paragraph. In the same paragraph the term “tongue” occurs, giving an even more precise clue for locating the exact place in which the required information is to be found. Each of these terms occurs only once in the text, so the reader does not need to deal with any competing information when matching the question to the relevant part of the text.

With a difficulty located in the lowest described level, Level 1b, this is one of the easiest questions in the PISA 2009 reading assessment. It does nevertheless require a low level of inference, since the reader has to understand that “it” in the last sentence refers to “your tongue”. A further element that might be expected to contribute to difficulty is that the focus of the question is relatively abstract: the reader is asked to identify a cause (“Why?”). Mitigating this potential difficulty, however, is the fact that the word “cause” is explicitly used in the text (“that may cause bad breath”), providing a clear pointer to the required answer, so long as the reader infers the semantic relationship between “why” and “cause”. It is worth noting that tasks at this lowest described level of PISA reading still demand some reading skill beyond mere decoding. It follows that students described as performing at Level 1b have demonstrated that they can read with a degree of **understanding**, in a manner consistent with the PISA definition of reading.

## BRUSHING YOUR TEETH – QUESTION 4

**Situation:** Educational

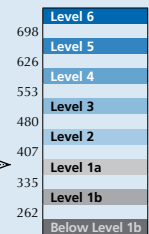
**Text format:** Continuous

**Text type:** Exposition

**Aspect:** Reflect and evaluate – Reflect on and evaluate the form of a text

**Question format:** Multiple choice

**Difficulty:** 399 (Level 1a)



Why is a pen mentioned in the text?

- A. To help you understand how to hold a toothbrush.
- B. Because you start in one corner with both a pen and a toothbrush.
- C. To show that you can brush your teeth in many different ways.
- D. Because you should take tooth brushing as seriously as writing.

### Scoring

**Full Credit:** A. To help you understand how to hold a toothbrush.

### Comment

The last of the tasks in this unit is located near the top of Level 1a in difficulty. Its aspect is **reflect and evaluate** because it requires standing back from the text and considering the intention of one part of it. Although this is a relatively abstract task in comparison with others in this unit, the wording of both the question stem and the key gives substantial support. The reference to “pen” in the stem directs the reader to the third paragraph. The wording of the key has a direct match with the wording in the relevant part of the text: “how to hold a toothbrush” and “hold the toothbrush the way ...” respectively. The task requires the reader to recognise an analogy, but the analogical thinking is, again, explicitly there in the text: “hold the toothbrush the way you hold a pen”.

The familiar content and the brevity of the text help to explain why this question is relatively easy, while its somewhat abstract focus accounts for the fact that it is the most difficult of the unit.



■ Figure 4.5 ■

**MOBILE PHONE SAFETY****Are mobile phones dangerous?****Key points**

- *Conflicting reports about the health risks of mobile phones appeared in the late 1990s.*
- *Millions of pounds have now been invested in scientific research to investigate the effects of mobile phones.*

Yes	No
1. Radio waves given off by mobile phones can heat up body tissue, having damaging effects.	Radio waves are not powerful enough to cause heat damage to the body.
2. Magnetic fields created by mobile phones can affect the way that your body cells work.	The magnetic fields are incredibly weak, and so unlikely to affect cells in our body.
3. People who make long mobile phone calls sometimes complain of fatigue, headaches, and loss of concentration.	These effects have never been observed under laboratory conditions and may be due to other factors in modern lifestyles.
4. Mobile phone users are 2.5 times more likely to develop cancer in areas of the brain adjacent to their phone ears.	Researchers admit it's unclear this increase is linked to using mobile phones.
5. The International Agency for Research on Cancer found a link between childhood cancer and power lines. Like mobile phones, power lines also emit radiation.	The radiation produced by power lines is a different kind of radiation, with much more energy than that coming from mobile phones.
6. Radio frequency waves similar to those in mobile phones altered the gene expression in nematode worms.	Worms are not humans, so there is no guarantee that our brain cells will react in the same way.

**If you use a mobile phone ...****Key points**

- *Given the immense numbers of mobile phone users, even small adverse effects on health could have major public health implications.*
- *In 2000, the Stewart Report (a British report) found no known health problems caused by mobile phones, but advised caution, especially among the young, until more research was carried out. A further report in 2004 backed this up.*

Do	Don't
Keep the calls short.	Don't use your mobile phone when the reception is weak, as the phone needs more power to communicate with the base station, and so the radio-wave emissions are higher.
Carry the mobile phone away from your body when it is on standby.	Don't buy a mobile phone with a high "SAR" value <sup>1</sup> . This means that it emits more radiation.
Buy a mobile phone with a long "talk time". It is more efficient, and has less powerful emissions.	Don't buy protective gadgets unless they have been independently tested.

1. SAR (specific absorption rate) is a measurement of how much electromagnetic radiation is absorbed by body tissue whilst using a mobile phone.

*"Mobile Phone Safety" on the previous two pages is from a website.*  
Use "Mobile Phone Safety" to answer the questions that follow.

**MOBILE PHONE SAFETY – QUESTION 2**

**Situation:** Public

**Text format:** Non-continuous

**Text type:** Exposition

**Aspect:** Integrate and interpret – Form a broad understanding

**Question format:** Multiple choice

**Difficulty:** 561 (Level 4)

698	Level 6
626	Level 5
553	Level 4
480	Level 3
407	Level 2
335	Level 1a
262	Level 1b
	Below Level 1b

What is the purpose of the [Key points](#)?

- To describe the dangers of using mobile phones.
- To suggest that debate about mobile phone safety is ongoing.
- To describe the precautions that people who use mobile phones should take.
- To suggest that there are no known health problems caused by mobile phones.



### Scoring

**Full Credit:** To suggest that debate about mobile phone safety is ongoing.

### Comment

Classified as a **form a broad understanding task within the integrate and interpret aspect**, this task focuses on detecting a theme from the repetition of a particular category of information, in this case the “Key Points”, a series of four boxed snippets ranged down the left hand side of the two-page text. Tasks addressing the broad understanding category are typically fairly easy, as they tend to focus on repeated and often prominent ideas in a text. However, several features of this text and task conspire to make it comparatively difficult, at Level 4. The four short Key Points tell their own story: they are related to but do not summarise the information in the body of the two main tables, so the reader needs to focus on what appears as a peripheral part of the text structure. Moreover, while all of the boxes have the caption “Key Points” the content is diverse in terms of text type, making the task of summary more difficult. The first two Key Points give a brief history of the controversy about mobile phones, the third makes a conditional proposition, and the fourth reports an equivocal finding. The fact that ambiguity, uncertainty and opposing ideas are the content of the Key Points is likely, of itself, to make the task more difficult. Here, identifying the “purpose” (which in this context is equivalent to the main theme) means establishing a hierarchy among ideas presented in the Key Points, and choosing the one that is most general and overarching. Options A and C represent different details of the Key Points, but not a single idea that could be described as overarching. Option D lifts a clause (out of context) from the fourth Key Point. Only option B, selected by 45% of students from across the OECD countries, presents a statement that synthesises the heterogeneous elements of the Key Points.

## MOBILE PHONE SAFETY – QUESTION 11

**Situation:** Public

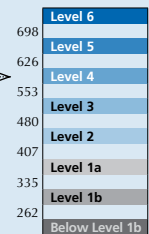
**Text format:** Non-continuous

**Text type:** Exposition

**Aspect:** Reflect and evaluate – Reflect on and evaluate the content of a text

**Question format:** Multiple choice

**Difficulty:** 604 (Level 4)



“It is difficult to prove that one thing has definitely caused another.”

What is the relationship of this piece of information to the Point 4 **Yes** and **No** statements in the table **Are mobile phones dangerous?**

- A. It supports the Yes argument but does not prove it.
- B. It proves the Yes argument.
- C. It supports the No argument but does not prove it.
- D. It shows that the No argument is wrong.

### Scoring

**Full Credit:** C. It supports the No argument but does not prove it.

### Comment

This task requires the reader to recognise the relationship between a generalised statement external to the text and a pair of statements in a table. It is classified as **reflect and evaluate** in terms of aspect because of this external reference point. This is the most difficult task in the **MOBILE PHONE SAFETY** unit, right on the border of Level 4 and Level 5. The degree of difficulty is influenced by a number of factors. First, the stem statement uses abstract terminology (“It is difficult to prove that one thing has definitely caused another”). Secondly – a relatively straightforward part of the task – the reader needs to work out which of the two tables is relevant to this task (the first one) and which point to look at (Point 4). Thirdly, the reader needs to assimilate the structure of the relevant table: namely, that it presents opposing statements in its two columns; as we have already noted, contrary ideas are intrinsically more difficult to deal with than complementary ones. Then, the reader needs to discern precisely how the **NO** statement challenges the **YES** statement in a particular instance. Finally, logical relationship between the **YES** and **NO** statements in Point 4 must be matched, again at an abstracted level, with one of the options presented in the multiple-choice format of the task. With all these challenges intrinsic to the task, it is not surprising therefore that only a little over one-third of students across OECD countries gained credit for it.



## MOBILE PHONE SAFETY – QUESTION 6

**Situation:** Public

**Text format:** Non-continuous

**Text type:** Exposition

**Aspect:** Reflect and evaluate – Reflect on and evaluate the content of a text

**Question format:** Open constructed response

**Difficulty:** 526 (Level 3)

698	Level 6
626	Level 5
553	Level 4
480	Level 3
407	Level 2
335	Level 1a
262	Level 1b
	Below Level 1b

Look at Point 3 in the **No** column of the table. In this context, what might one of these “other factors” be? Give a reason for your answer.

### Scoring

#### Full Credit

Identifies a factor in modern lifestyles that could be related to fatigue, headaches, or loss of concentration. The explanation may be self-evident, or explicitly stated. For example:

- Not getting enough sleep. If you don't, you will be tired.
- Being too busy. That makes you tired.
- Too much homework, that makes you tired AND gives you headaches.
- Noise – that gives you a headache.
- Stress.
- Working late.
- Exams.
- The world is just too loud.
- People don't take time to relax anymore.
- People don't prioritise the things that matter, so they get grumpy and sick.
- Computers.
- Pollution.
- Watching too much TV.
- Drugs.
- Microwave ovens.
- Too much emailing.

#### Comment

Another task in which the reader needs to reflect on and evaluate the content of a text, this task calls on the ability to relate the text to knowledge external to the text. Readers must give an example from their own experience of a factor in modern life, other than mobile phones, that could explain “fatigue, headaches and loss of concentration”. As in the previous task, one step in completing this task successfully is to locate the relevant information using a number reference (here, “Point 3”). The reader's subsequent steps are less complex than in the previous task, since only the YES part of Point 3 need be taken into account. In addition, the external information that needs to be drawn on is directly related to personal experience, rather than to an abstracted logical statement.

A wide range of responses earn full credit for this task. Full credit is given for producing a factor and providing an explanation as to why this might cause fatigue, headaches and loss of concentration. An example of this kind of response is “Not getting enough sleep. If you don't, you will be fatigued.” Full credit is also given if it is considered that the explanation is implicit in the statement of the factor, in which case no explicit explanation is required. An example of this kind of response is “stress”. On the other hand, a response such as “lifestyle” is judged too vague, without a supporting explanation or elaboration, and so is given no credit.

Towards the top of Level 3, this task was successfully completed by just over half of the students in OECD countries.



## MOBILE PHONE SAFETY – QUESTION 9

**Situation:** Public

**Text format:** Non-continuous

**Text type:** Exposition

**Aspect:** Integrate and interpret – Develop an interpretation

**Question format:** Multiple choice

**Difficulty:** 488 (Level 3)

698	Level 6
626	Level 5
553	Level 4
480	Level 3
407	Level 2
335	Level 1a
262	Level 1b
	Below Level 1b

Look at the table with the heading **If you use a mobile phone ...**

Which of these ideas is the table based on?

- A. There is no danger involved in using mobile phones.
- B. There is a proven risk involved in using mobile phones.
- C. There may or may not be danger involved in using mobile phones, but it is worth taking precautions.
- D. There may or may not be danger involved in using mobile phones, but they should not be used until we know for sure.
- E. The **Do** instructions are for those who take the threat seriously, and the **Don't** instructions are for everyone else.

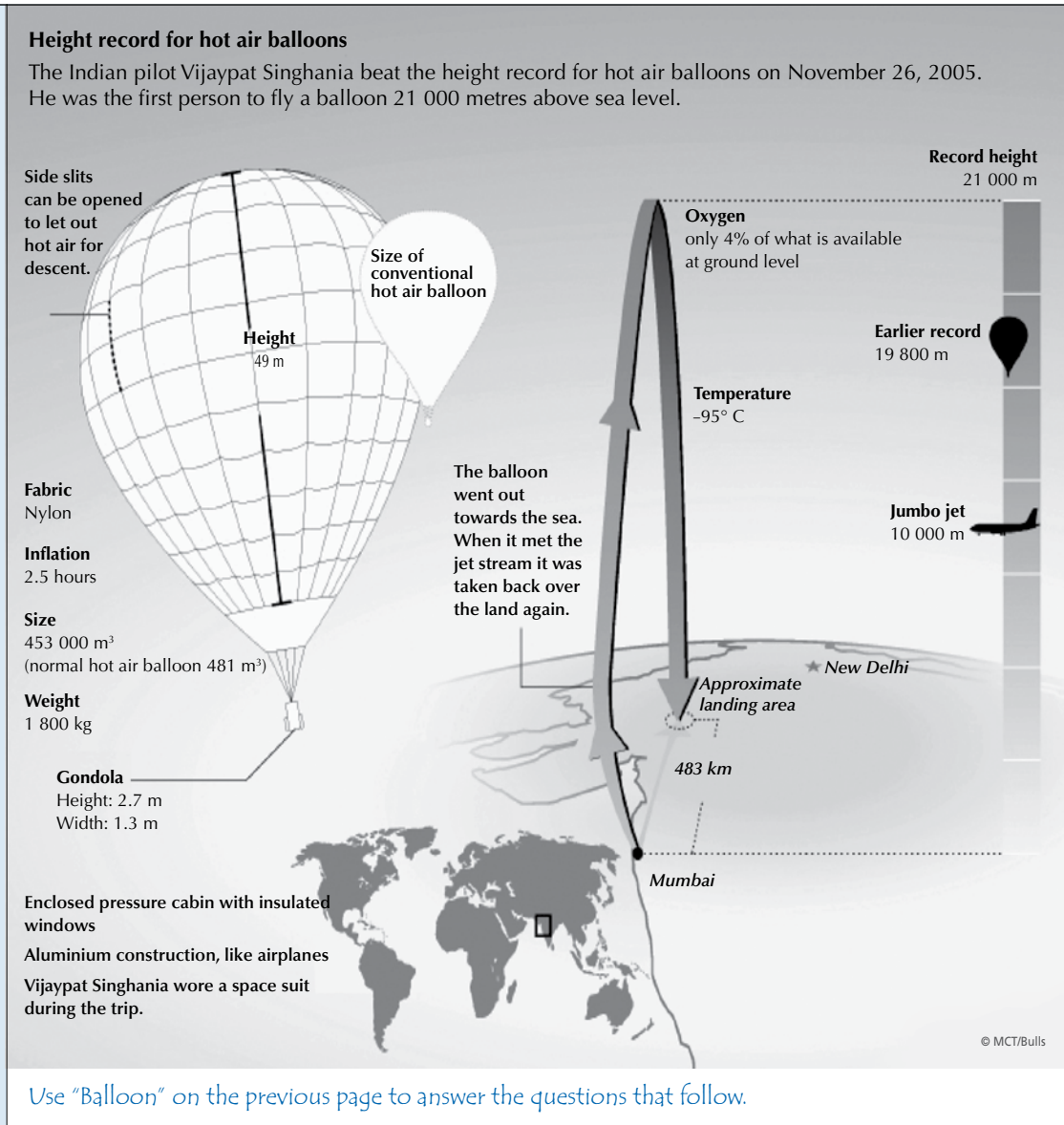
### Scoring

**Full Credit:** C. There may or may not be danger involved in using mobile phones, but it is worth taking precautions.

### Comment

In this task the reader is explicitly directed to look at the second table, and to recognise its underlying assumption. In fact, the assumption is indicated in the last boxed Key Point: that in the absence of decisive evidence about the danger of mobile phones, it is advisable to take caution. The task asks readers to infer the consequences of this judgment, which can be done by checking that the table's contents are consistent with the Key Point. Alternatively, the reader can consult only the table and draw an independent conclusion from it. Option A is incorrect since it flatly contradicts the substance of the Key Point, and is inconsistent with the import of a set of injunctions that neither embargoes nor gives carte blanche to mobile phone use. Option B is rather more plausible, but the word "proven" makes it wrong in light of the information in the Key Point that no known health problems caused by mobile phones were found in the two studies that were cited. Option C presents itself as the best answer, consistent with both the Key Point and all the detail of the DO and DON'T columns. Option D can be dismissed as nothing more than the heading of a table that reads: "If you use a mobile phone ...", and option E sets up a specious opposition that has no support in the text. Just under two-thirds of students selected the correct response, making it the easiest of the four tasks related to this challenging stimulus.

■ Figure 4.6 ■  
**BALLOON**



### BALLOON – QUESTION 8

**Situation:** Educational

**Text format:** Non-continuous

**Text type:** Description

**Aspect:** Integrate and interpret – Form a broad understanding

**Question format:** Multiple choice

**Difficulty:** 370 (Level 1a)

698	Level 6
626	Level 5
553	Level 4
480	Level 3
407	Level 2
335	Level 1a
262	Level 1b
	Below Level 1b

What is the main idea of this text?

- A. Singhania was in danger during his balloon trip.
- B. Singhania set a new world record.
- C. Singhania travelled over both sea and land.
- D. Singhania's balloon was enormous.





### Scoring

**Full Credit:** B. Singhanian set a new world record.

### Comment

The main idea of this non-continuous text is stated explicitly and prominently several times, including in the title, “Height record for hot air balloon”. The prominence and repetition of the required information helps to explain its easiness: it is located in the lower half of Level 1a.

Although the main idea is explicitly stated, the question is classified as integrate and interpret, with the sub-classification forming a broad understanding, because it involves distinguishing the most significant and general from subordinate information in the text. The first option – “Singhanian was in danger during his balloon trip” – is a plausible speculation, but it is not supported by anything in the text, and so cannot qualify as a main idea. The third option – “Singhanian travelled over both sea and land” – accurately paraphrases information from the text, but it is a detail rather than the main idea. The fourth option – “Singhanian’s balloon was enormous” – refers to a conspicuous graphic feature in the text but, again, it is subordinate to the main idea.

### BALLOON – QUESTION 3

**Situation:** Educational

**Text format:** Non-continuous

**Text type:** Description

**Aspect:** Access and retrieve – Retrieve information

**Question format:** Short response

**Difficulty:** Full credit 595 (Level 4); Partial credit 449 (Level 2)

698	Level 6
	Level 5
626	Level 4
553	Level 3
480	Level 2
407	Level 1a
335	Level 1b
262	Below Level 1b

Vijaypat Singhanian used technologies found in two other types of transport. Which types of transport?

1. ....
2. ....

### Scoring

**Full Credit:** Refers to BOTH airplanes AND spacecraft (in either order, can include both answers on one line). For example:

- 1. Aircraft  
2. Spacecraft
- 1. Airplanes  
2. Space ships
- 1. Air travel  
2. Space travel
- 1. Planes  
2. Space rockets
- 1. Jets  
2. Rockets

**Partial Credit:** Refers to EITHER airplanes OR spacecraft. For example:

- Spacecraft
- Space travel
- Space rockets
- Rockets
- Aircraft
- Airplanes
- Air travel
- Jets



### Comment

In this task full credit is given for responses that lists the two required types of transport, and partial credit is given to responses that listed one type. The scoring rules reproduced above demonstrate that credit is available for several different paraphrases of the terms “airplanes” and “spacecraft”.

The partial credit score is located in the upper half of Level 2 while the full credit score is located at Level 4, illustrating the fact that **access and retrieve** questions can create a significant challenge. The difficulty of the task is particularly influenced by a number of features of the text. The layout, with several different kinds of graphs and multiple captions, is quite a common type of non-continuous presentation often seen in magazines and modern textbooks, but because it does not have a conventional ordered structure (unlike, for example, a table or graph), finding specific pieces of discrete information is relatively inefficient. Captions (“Fabric”, “Record height”, and so on) give some support to the reader in navigating the text, but the information specific required for this task does not have a caption, so that readers have to generate their own categorisation of the relevant information as they search. Having once found the required information, inconspicuously located at the bottom left-hand corner of the diagram, the reader needs to recognise that the “aluminium construction, like airplanes” and the “space suit” are associated with categories of transport. In order to obtain credit for this question, the response needs to refer to a form or forms of transport, rather than simply transcribing an approximate section of text. Thus “space travel” is credited, but “space suit” is not. A significant piece of competing information in the text constitutes a further difficulty: many students referred to a “jumbo jet” in their answer. Although “air travel” or “airplane” or “jet” is given credit, “jumbo jet” is deemed to refer specifically to the image and caption on the right of the diagram. This answer is not given credit as the jumbo jet in the illustration is not included in the material with reference to technology used for Singhanian’s balloon.

### BALLOON – QUESTION 4

**Situation:** Educational

**Text format:** Non-continuous

**Text type:** Description

**Aspect:** Reflect and evaluate – Reflect on and evaluate the content of a text

**Question format:** Open Constructed Response

**Difficulty:** 510 (Level 3)

698	Level 6
626	Level 5
553	Level 4
480	Level 3
407	Level 2
335	Level 1a
262	Level 1b
	Below Level 1b

What is the purpose of including a drawing of a jumbo jet in this text?

.....

.....

### Scoring

**Full Credit:** Refers explicitly or implicitly to the height of the balloon OR to the record. May refer to comparison between the jumbo jet and the balloon.

- To show how high the balloon went.
- To emphasise the fact that the balloon went really, really high.
- To show how impressive his record really was – he went higher than jumbo jets!
- As a point of reference regarding height.
- To show how impressive his record really was. [minimal]

### Comment

The main idea of the text is to describe the height record set by Vijaypat Singhanian in his extraordinary balloon. The diagram on the right-hand side of the graphic, which includes the jumbo jet, implicitly contributes to the “wow!” factor of the text, showing just how impressive the height achieved by Singhanian was by comparing it with what we usually associate with grand height: a jumbo jet’s flight. In order to gain credit for this task, students must recognise the persuasive intent of including the illustration of the jumbo jet. For this reason the task is classified as **reflect and evaluate**, with the sub-category **reflect on and evaluate the content of a text**. At the upper end of Level 3, this question is moderately difficult.



## BALLOON – QUESTION 6

**Situation:** Educational

**Text format:** Non-continuous

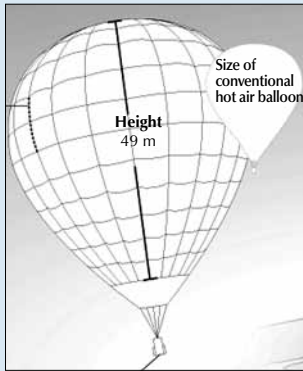
**Text type:** Description

**Aspect:** Reflect and evaluate – Reflect on and evaluate the content of a text

**Question format:** Multiple choice

**Difficulty:** 411 (Level 2)

698	Level 6
626	Level 5
553	Level 4
480	Level 3
407	Level 2
335	Level 1a
262	Level 1b
	Below Level 1b



Why does the drawing show two balloons?

- A. To compare the size of Singhanian's balloon before and after it was inflated.
- B. To compare the size of Singhanian's balloon with that of other hot air balloons.
- C. To show that Singhanian's balloon looks small from the ground.
- D. To show that Singhanian's balloon almost collided with another balloon.

### Scoring

**Full Credit:** B. To compare the size of Singhanian's balloon with that of other hot air balloons.

### Comment

It is important for readers to be aware that texts are not randomly occurring artefacts, but are constructed deliberately and with intent, and that part of the meaning of a text is found in the elements that authors choose to include. Like the previous task, this task is classified under **reflect and evaluate** because it asks about authorial intent. It focuses on a graphic element – here the illustration of two balloons – and asks students to consider the purpose of this inclusion. In the context of the over-arching idea of the text, to describe (and celebrate) Singhanian's flight, the balloon illustration sends the message, "This is a really big balloon!", just as the jumbo jet illustration sends the message, "This is a really high flight!" The caption on the smaller balloon ("Size of a conventional hot air balloon") makes it obvious that this is a different balloon to Singhanian's, and therefore, for attentive readers, renders options A and C implausible. Option D has no support in the text. With a difficulty near the bottom of Level 2, this is a rather easy task.



■ Figure 4.7 ■

**BLOOD DONATION**

Blood donation is essential.

There is no product that can fully substitute for human blood. Blood donation is thus irreplaceable and essential to save lives.

In France, each year, 500,000 patients benefit from a blood transfusion.

The instruments for taking the blood are sterile and single-use (syringe, tubes, bags).

There is no risk in giving your blood.

**Blood donation**

It is the best-known kind of donation, and takes from 45 minutes to 1 hour.

A 450-ml bag is taken as well as some small samples on which tests and checks will be done.

- A man can give his blood five times a year, a woman three times.
- Donors can be from 18 to 65 years old.

An 8-week interval is compulsory between each donation.

*“Blood Donation Notice” on the previous page is from a French website.*

Use “Blood Donation Notice” to answer the questions that follow.

**BLOOD DONATION NOTICE – QUESTION 8**

**Situation:** Public

**Text format:** Continuous

**Text type:** Argumentation

**Aspect:** Integrate and interpret – Develop an interpretation

**Question format:** Open constructed response

**Difficulty:** 438 (Level 2) ■

698	Level 6
626	Level 5
553	Level 4
480	Level 3
407	Level 2
335	Level 1a
262	Level 1b
	Below Level 1b

An eighteen-year-old woman who has given her blood twice in the last twelve months wants to give blood again. According to “Blood Donation Notice”, on what condition will she be allowed to give blood again?

.....

.....

**Scoring**

**Full Credit:** Identifies that enough time must have elapsed since her last donation.

- Depends whether it has been 8 weeks since her last donation or not.
- She can if it has been long enough, otherwise she can't.

**Comment**

At a level of difficulty around the middle of Level 2, this task asks the reader to apply the information in the text to a practical case. This is the kind of reading activity that is typically associated with such a text in everyday life, and thus meets one of PISA's aims in answering questions about how well young people at the end of compulsory schooling are equipped to meet the challenges of their future lives.

The reader must match the case described in the question stem with four pieces of information provided in the second half of the text: the age and sex of the prospective donor, the number of times a person is allowed to give



blood, and the interval required between donations. Reference to this last piece of information is needed in order to meet the task's requirement to stipulate the "condition" under which the young woman can give blood. As evidenced in the two examples of full credit responses, students are given credit for either a specific answer that includes reference to the interval of eight weeks between donations, or for a more generalised answer, such as "She can if it has been long enough, otherwise she can't".

## BLOOD DONATION NOTICE – QUESTION 9

**Situation:** Public

**Text format:** Continuous

**Text type:** Argumentation

**Aspect:** Reflect and evaluate – Reflect on and evaluate the content of a text

**Question format:** Multiple choice

**Difficulty:** 368 (Level 1a)

698	Level 6
626	Level 5
553	Level 4
480	Level 3
407	Level 2
335	Level 1a
262	Level 1b
	Below Level 1b

The text says: "The instruments for taking the blood are sterile and single-use ..."

Why does the text include this information?

- A. To reassure you that blood donation is safe.
- B. To emphasise that blood donation is essential.
- C. To explain the uses of your blood.
- D. To give details of the tests and checks.

### Scoring

QUESTION INTENT:

*Reflect and evaluate:* Reflect on and evaluate the content of a text.

Recognise the persuasive purpose of a phrase in an advertisement.

**Full Credit:** A. To reassure you that blood donation is safe.

### Comment

To gain credit for this task, students must recognise the persuasive purpose of part of an advertisement. The task is classified as **reflect and evaluate** because students need to consider the wider context of what appears to be a simple statement of fact in order to recognise the underlying purpose for its inclusion.

The relative easiness of this task, which is located in the lower half of Level 1a, can be attributed to the brevity of the text and also to the fact that it deals with an everyday topic. Another characteristic of relatively easy questions exemplified here is that they typically draw on information that is consistent with common preconceptions: there is nothing contrary to expectations in the notion that people are encouraged to donate blood and reassured that donation involves no risk. Although the persuasive intent of this text is not stated explicitly in the words of the blood donation notice, the idea that it is encouraging people to donate blood and reassuring them about the safety of blood donation can be inferred from several statements. The text begins with "Blood donation is essential", a notion that is repeated and elaborated in the second paragraph ("irreplaceable and essential"). The text also refers to the absence of risk immediately after the section of text in focus in this task, though the logical connection between the two paragraphs – evidence: conclusion – must be inferred.



■ Figure 4.8 ■

**MISER****THE MISER AND HIS GOLD**

*A fable by Aesop*

A miser sold all that he had and bought a lump of gold, which he buried in a hole in the ground by the side of an old wall. He went to look at it daily. One of his workmen observed the miser's frequent visits to the spot and decided to watch his movements. The workman soon discovered the secret of the hidden treasure, and digging down, came to the lump of gold, and stole it. The miser, on his next visit, found the hole empty and began to tear his hair and to make loud lamentations. A neighbour, seeing him overcome with grief and learning the cause, said, "Pray do not grieve so; but go and take a stone, and place it in the hole, and fancy that the gold is still lying there. It will do you quite the same service; for when the gold was there, you had it not, as you did not make the slightest use of it."

Use the fable "The Miser and his Gold" on the previous page to answer the questions that follow.

**MISER – QUESTION 1**

**Situation:** *Personal*

**Text format:** *Continuous*

**Text type:** *Narration*

**Aspect:** *Integrate and interpret – Develop an interpretation*

**Question format:** *Closed constructed response*

**Difficulty:** 373 (Level 1a)

698	Level 6
626	Level 5
553	Level 4
480	Level 3
407	Level 2
335	Level 1a
262	Level 1b
	Below Level 1b

Read the sentences below and number them according to the sequence of events in the text.

- The miser decided to turn all his money into a lump of gold.
- A man stole the miser's gold.
- The miser dug a hole and hid his treasure in it.
- The miser's neighbour told him to replace the gold with a stone.

**Scoring**

**Full Credit:** All four correct: 1, 3, 2, 4 in that order.

**Comment**

Fables are a popular and respected text type in many cultures and they are a favourite text type in reading assessments for similar reasons: they are short, self-contained, morally instructive and have stood the test of time. While perhaps not the most common reading material for young adults in OECD countries they are nevertheless likely to be familiar from childhood, and the pithy, often acerbic observations of a fable can pleasantly surprise even a blasé 15-year-old. MISER is typical of its genre: it captures and satirises a particular human weakness in a neat economical story, executed in a single paragraph.

Since **narrations** are defined as referring to properties of objects in time, typically answering "when" questions, it is appropriate to include a task based on a narrative text that asks for a series of statements about the story to be put into the correct sequence. With such a short text, and with statements in the task that are closely matched with the terms of the story, this is an easy task, around the middle of Level 1a. On the other hand, the language of the text is rather formal and has some old-fashioned locutions. (Translators were asked to reproduce the fable-like style of the source versions.) This characteristic of the text is likely to have added to the difficulty of the question.



## MISER – QUESTION 7

**Situation:** Personal

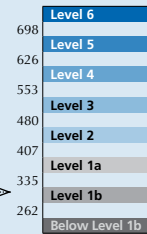
**Text format:** Continuous

**Text type:** Narration

**Aspect:** Access and retrieve – Retrieve information

**Question format:** Short response

**Difficulty:** 310 (Level 1b)



How did the miser get a lump of gold?

.....

### Scoring

**Full Credit:** States that he sold everything he had. May paraphrase or quote directly from the text.

- He sold all he had.
- He sold all his stuff.
- He bought it. [implicit connection to selling everything he had]

### Comment

This is one of the easiest tasks in PISA reading, with a difficulty in the middle of Level 1b. The reader is required to **access and retrieve** a piece of explicitly stated information in the opening sentence of a very short text. To gain full credit, the response can either quote directly from the text – “He sold all that he had” – or provide a paraphrase such as “He sold all his stuff”. The formal language of the text, which is likely to have added difficulty in other tasks in the unit, is unlikely to have much impact here because the required information is located at the very beginning of the text. Although this is an extremely easy question in PISA’s frame of reference, it still requires a small degree of inference, beyond the absolutely literal: the reader must infer that there is a causal connection between the first proposition (that the miser sold all he had) and the second (that he bought gold).

## MISER – QUESTION 5

**Situation:** Personal

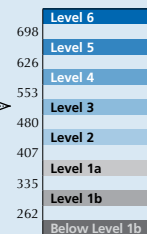
**Text format:** Continuous

**Text type:** Narration

**Aspect:** Integrate and interpret – Develop an interpretation

**Question format:** Open constructed response

**Difficulty:** 548 (Level 3)



Here is part of a conversation between two people who read “The Miser and his Gold”.

**Speaker 1**

The neighbour was nasty. He could have recommended replacing the gold with something better than a stone.

**Speaker 2**

No he couldn't. The stone was important in the story.

What could Speaker 2 say to support his point of view?

.....

.....



### Scoring

#### Full Credit

Recognises that the message of the story depends on the gold being replaced by something useless or worthless.

- It needed to be replaced by something worthless to make the point.
- The stone is important in the story, because the whole point is he might as well have buried a stone for all the good the gold did him.
- If you replaced it with something better than a stone, it would miss the point because the thing buried needs to be something really useless.
- A stone is useless, but for the miser, so was the gold!
- Something better would be something he could use – he didn't use the gold, that's what the guy was pointing out.
- Because stones can be found anywhere. The gold and the stone are the same to the miser. [*"can be found anywhere" implies that the stone is of no special value*]

#### Comment

*This task takes the form of setting up a dialogue between two imaginary readers, to represent two conflicting interpretations of the story. In fact only the second speaker's position is consistent with the overall implication of the text, so that in providing a supporting explanation readers demonstrate that they have understood the "punch line" – the moral import – of the fable. The relative difficulty of the task, near the top of Level 3, is likely to be influenced by the fact that readers need to do a good deal of work to generate a full credit response. First they must make sense of the neighbour's speech in the story, which is expressed in a formal register. (As noted, translators were asked to reproduce the fable-like style.) Secondly, the relationship between the question stem and the required information is not obvious: there is little or no support in the stem ("What could Speaker 2 say to support his point of view?") to guide the reader in interpreting the task, though the reference to the stone and the neighbour by the speakers should point the reader to the end of the fable.*

*As shown in examples of responses, to gain full credit, students could express, in a variety of ways, the key idea that wealth has no value unless it is used. Vague gestures at meaning, such as "the stone had a symbolic value", are not given credit.*





■ Figure 4.9 ■

### THE PLAY'S THE THING

*Takes place in a castle by the beach in Italy.*

#### FIRST ACT

*Ornate guest room in a very nice beachside castle. Doors on the right and left. Sitting*

- 5 *room set in the middle of the stage: couch, table, and two armchairs. Large windows at the back. Starry night. It is dark on the stage. When the curtain goes up we hear men conversing loudly behind the door on the left.*
- 10 *The door opens and three tuxedoed gentlemen enter. One turns the light on immediately. They walk to the centre in silence and stand around the table. They sit down together, Gál in the armchair to the left, Turai in the one on*
- 15 *the right, Ádám on the couch in the middle. Very long, almost awkward silence. Comfortable stretches. Silence. Then:*

#### GÁL

Why are you so deep in thought?

#### 20 TURAI

I'm thinking about how difficult it is to begin a play. To introduce all the principal characters in the beginning, when it all starts.

#### ÁDÁM

- 25 I suppose it must be hard.

#### TURAI

It is – devilishly hard. The play starts. The audience goes quiet. The actors enter the stage and the torment begins. It's an eternity,

- 30 sometimes as much as a quarter of an hour before the audience finds out who's who and what they are all up to.

#### GÁL

- 35 Quite a peculiar brain you've got. Can't you forget your profession for a single minute?

#### TURAI

That cannot be done.

#### GÁL

- 40 Not half an hour passes without you discussing theatre, actors, plays. There are other things in this world.

#### TURAI

There aren't. I am a dramatist. That is my curse.

#### 45 GÁL

You shouldn't become such a slave to your profession.

#### TURAI

- 50 If you do not master it, you are its slave. There is no middle ground. Trust me, it's no joke starting a play well. It is one of the toughest problems of stage mechanics. Introducing your characters promptly. Let's look at this scene here, the three of us. Three gentlemen in tuxedos. Say they enter not this room in this lordly castle, but rather a stage, just when a play begins. They would have to chat about a whole lot of uninteresting topics until it came out

- 60 who we are. Wouldn't it be much easier to start all this by standing up and introducing ourselves? Stands up. Good evening. The three of us are guests in this castle. We have just arrived from the dining room where we had an excellent dinner and drank two bottles of champagne. My name is Sándor TURAI, I'm a playwright, I've been writing plays for thirty years, that's my profession. Full stop.
- 70 Your turn.

#### GÁL

Stands up. My name is GÁL, I'm also a playwright. I write plays as well, all of them in the company of this gentleman here. We are a famous playwright duo. All playbills of good comedies and operettas read: written by GÁL and TURAI. Naturally, this is my profession as well.

#### GÁL and TURAI

- 80 *Together.* And this young man ...

#### ÁDÁM

Stands up. This young man is, if you allow me, Albert ÁDÁM, twenty-five years old, composer. I wrote the music for these kind gentlemen for their latest operetta. This is my first work for the stage. These two elderly angels have discovered me and now, with their help, I'd like to become famous. They got me invited to this castle. They got my dress-coat and tuxedo made. In other words, I am poor and unknown, for now. Other than that I'm an orphan and my grandmother raised me. My grandmother has passed away. I am all alone in this world. I have no name, I have no money.

#### 95

#### TURAI

But you are young.

#### GÁL

And gifted.

#### 100 ÁDÁM

And I am in love with the soloist.

#### TURAI

You shouldn't have added that. Everyone in the audience would figure that out anyway.

#### 105 *They all sit down.*

#### TURAI

Now wouldn't this be the easiest way to start a play?

#### GÁL

- 110 If we were allowed to do this, it would be easy to write plays.

#### TURAI

Trust me, it's not that hard. Just think of this whole thing as ...

#### 115 GÁL

All right, all right, all right, just don't start talking about the theatre again. I'm fed up with it. We'll talk tomorrow, if you wish.

*"The Play's the Thing"* is the beginning of a play by the Hungarian dramatist Ferenc Molnár.

Use *"The Play's the Thing"* on the previous two pages to answer the questions that follow. (Note that line numbers are given in the margin of the script to help you find parts that are referred to in the questions.)



## THE PLAY'S THE THING – QUESTION 3

**Situation:** Personal

**Text format:** Continuous

**Text type:** Narration

**Aspect:** Integrate and interpret – Develop an interpretation

**Question format:** Short response

**Difficulty:** 730 (Level 6)

698	Level 6
626	Level 5
553	Level 4
480	Level 3
407	Level 2
335	Level 1a
262	Level 1b
	Below Level 1b

What were the characters in the play doing **just before** the curtain went up?

.....

### Scoring

**Full Credit:** Refers to dinner or drinking champagne. May paraphrase or quote the text directly.

- They have just had dinner and champagne.
- “We have just arrived from the dining room where we had an excellent dinner.” [direct quotation]
- “An excellent dinner and drank two bottles of champagne.” [direct quotation]
- Dinner and drinks.
- Dinner.
- Drank champagne.
- Had dinner and drank.
- They were in the dining room.

### Comment

This task illustrates several features of the most difficult tasks in PISA reading. The text is long by PISA standards, and it may be supposed that the fictional world depicted is remote from the experience of most 15-year-olds. The introduction to the unit tells students that the stimulus of **THE PLAY'S THE THING** is the beginning of a play by the Hungarian dramatist Ferenc Molnár, but there is no other external orientation. The setting (“a castle by the beach in Italy”) is likely to be exotic to many, and the situation is only revealed gradually through the dialogue itself. While individual pieces of vocabulary are not particularly difficult, and the tone is often chatty, the register of the language is a little mannered. Perhaps most importantly a level of unfamiliarity is introduced by the abstract theme of the discussion: a sophisticated conversation between characters about the relationship between life and art, and the challenges of writing for the theatre. The text is classified as narration because this theme is dealt with as part of the play's narrative.

While all the tasks in this unit acquire a layer of difficulty associated with the challenges of the text, the cognitive demand of this task in particular is also attributable to the high level of interpretation required to define the meaning of the question's terms, in relation to the text. The reader needs to be alert to the distinction between characters and actors. The question refers to what the characters (not the actors) were doing “just before the curtain went up”. This is potentially confusing since it requires recognition of a shift between the real world of a stage in a theatre, which has a curtain, and the imaginary world of Gal, Turai and Adam, who were in the dining room having dinner just before they entered the guest room (the stage setting). A question that assesses students' capacity to distinguish between real and fictional worlds seems particularly appropriate in relation to a text whose theme is about just that, so that the complexity of the question is aligned with the content of the text.

A further level of the task's difficulty is introduced by the fact that the required information is in an unexpected location. The question refers to the action “before the curtain went up”, which would typically lead one to search at the opening of the scene, the beginning of the extract. On the contrary, the information is actually found about half-way through the extract, when Turai reveals that he and his friends “have just arrived from the dining room”. While the scoring for the question shows that several kinds of response are acceptable, to be given full credit readers must demonstrate that they have found this inconspicuous piece of information. The need to assimilate information that is contrary to expectations – where the reader needs to give full attention to the text in defiance of preconceptions – is highly characteristic of the most demanding reading tasks in PISA.



## THE PLAY'S THE THING – QUESTION 4

**Situation:** Personal

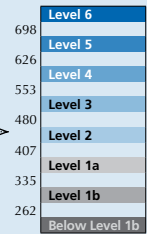
**Text format:** Continuous

**Text type:** Narration

**Aspect:** Integrate and interpret – Develop an interpretation

**Question format:** Multiple choice

**Difficulty:** 474 (Level 2)



“It’s an eternity, sometimes as much as a quarter of an hour ...” (lines 29–30)

According to Turai, why is a quarter of an hour “an eternity”?

- A. It is a long time to expect an audience to sit still in a crowded theatre.
- B. It seems to take forever for the situation to be clarified at the beginning of a play.
- C. It always seems to take a long time for a dramatist to write the beginning of a play.
- D. It seems that time moves slowly when a significant event is happening in a play.

### Scoring

**Full Credit:** B. It seems to take forever for the situation to be clarified at the beginning of a play.

### Comment

Near the borderline between Level 2 and Level 3, this question together with the previous one illustrates the fact that questions covering a wide range of difficulties can be based on a single text.

Unlike in the previous task, the stem of this task directs the reader to the relevant section in the play, even quoting the lines, thus relieving the reader of any challenge in figuring out where the necessary information is to be found. Nevertheless, the reader needs to understand the context in which the line is uttered in order to respond successfully. In fact, the implication of “It seems to take forever for the situation to be clarified at the beginning of a play” underpins much of the rest of this extract, which enacts the solution of characters explicitly introducing themselves at the beginning of a play instead of waiting for the action to reveal who they are. Insofar as the utterance that is quoted in the stem prompts most of the rest of this extract, repetition and emphasis support the reader in integrating and interpreting the quotation. In that respect too, this task clearly differs from Question 3, in which the required information is only provided once, and is buried in an unexpected part of the text.

## THE PLAY'S THE THING – QUESTION 7

**Situation:** Personal

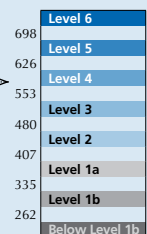
**Text format:** Continuous

**Text type:** Narration

**Aspect:** Integrate and interpret – Form a broad understanding

**Question format:** Multiple choice

**Difficulty:** 556 (Level 4)



Overall, what is the dramatist Molnár doing in this extract?

- A. He is showing the way that each character will solve his own problems.
- B. He is making his characters demonstrate what an eternity in a play is like.
- C. He is giving an example of a typical and traditional opening scene for a play.
- D. He is using the characters to act out one of his own creative problems.

### Scoring

**Full Credit:** D. He is using the characters to act out one of his own creative problems.

### Comment

In this task the reader is asked to take a global perspective, **form a broad understanding** by integrating and interpreting the implications of the dialogue across the text. The task involves recognising the conceptual theme of a section of a play, where the theme is literary and abstract. This relatively unfamiliar territory for most 15-year-olds is likely to constitute the difficulty of the task, which is located at Level 4. A little under half of the students in OECD countries gained full credit for this task, with the others divided fairly evenly across the three distractors.



■ Figure 4.10 ■  
**TELECOMMUTING**

**The way of the future**

Just imagine how wonderful it would be to “telecommute”<sup>1</sup> to work on the electronic highway, with all your work done on a computer or by phone! No longer would you have to jam your body into crowded buses or trains or waste hours and hours travelling to and from work. You could work wherever you want to – just think of all the job opportunities this would open up!

*Molly*

**Disaster in the making**

Cutting down on commuting hours and reducing the energy consumption involved is obviously a good idea. But such a goal should be accomplished by improving public transportation or by ensuring that workplaces are located near where people live. The ambitious idea that telecommuting should be part of everyone’s way of life will only lead people to become more and more self-absorbed. Do we really want our sense of being part of a community to deteriorate even further?

*Richard*

1. “Telecommuting” is a term coined by Jack Nilles in the early 1970s to describe a situation in which workers work on a computer away from a central office (for example, at home) and transmit data and documents to the central office via telephone lines.

Use “Telecommuting” above to answer the questions that follow.

**TELECOMMUTING – QUESTION 1**

**Situation:** Occupational

**Text format:** Multiple

**Text type:** Argumentation

**Aspect:** Integrate and interpret – Form a broad understanding

**Question format:** Multiple choice

**Difficulty:** 537 (Level 3) ■

698	Level 6
626	Level 5
553	Level 4
480	Level 3
407	Level 2
335	Level 1a
262	Level 1b
	Below Level 1b

What is the relationship between “The way of the future” and “Disaster in the making”?

- A. They use different arguments to reach the same general conclusion.
- B. They are written in the same style but they are about completely different topics.
- C. They express the same general point of view, but arrive at different conclusions.
- D. They express opposing points of view on the same topic.

**Scoring**

**Full Credit:** D. They express opposing points of view on the same topic.

**Comment**

The stimulus for the unit **TELECOMMUTING** is two short texts that offer contrasting opinions on telecommuting, defined in a footnote to the text as “working on a computer away from a central office”. The only addition to the originally submitted text that was made by PISA test developers was this footnote. It was assumed that the term “telecommuting” would be unfamiliar to most 15-year-olds. The footnote was included in order to avoid giving an advantage to students whose language would allow them to unpack the meaning of this compound word. For example, students tested in English may have been able to infer the meaning of the word by combining the meaning of “tele” (distant) and “commute”. By contrast, some countries in which English is not the testing language used the English term or a transliteration, which would not provide the same clues to the meaning.



The purpose of each of the short texts in the stimulus is to persuade readers to a point of view, so the stimulus is classified as **argumentation**. Given that the purpose of the stimulus material is to discuss an issue related to working life, the text is classified as occupational in terms of situation. The two pieces that make up the stimulus are both continuous, but because they were generated independently and juxtaposed for the purpose of the assessment, the text format classification of this text is **multiple**.

This question requires students to recognise the relationship between the two short texts. To answer correctly, students must first form a global understanding of each of the short texts, and then identify the relationship between them: that is, that they express contrasting points of view on the same topic. A factor contributing to the difficulty of this question is the level of interpretation required to identify the position that is expressed in each text. In the first text the author's position is signalled clearly early in the text ("Just imagine how wonderful it would be to 'telecommute' to work ...") and reinforced throughout. In contrast the second piece contains no direct statement of the author's own position: instead, it is written as a series of responses to arguments that the author opposes, so understanding the position of the second author requires a greater level of interpretation than understanding the position of the first author. Once the work of interpreting the position of each author has been done, recognising that the positions are contrasting is relatively straightforward. The weakest students chose option B. These students fail to recognise that the two texts are about the same topic. Students who chose options A and C recognise that the two texts are about the same topic, but fail to identify that they express contrasting views. At Level 3, just over one-half of the students in OECD countries gained credit for this question.

## TELECOMMUTING – QUESTION 7

**Situation:** Occupational

**Text format:** Continuous

**Text type:** Argumentation

**Aspect:** Reflect and evaluate – Reflect on and evaluate the content of a text

**Question format:** Open constructed response

**Difficulty:** 514 (Level 3) ■

698	Level 6
626	Level 5
553	Level 4
480	Level 3
407	Level 2
335	Level 1a
262	Level 1b
	Below Level 1b

What is one kind of work for which it would be difficult to telecommute? Give a reason for your answer.

.....

.....

.....

.....

### Scoring

#### QUESTION INTENT:

*Reflect and evaluate:* Reflect on and evaluate the content of a text

Use prior knowledge to generate an example that fits a category described in a text

**Full Credit:** Identifies a kind of work and gives a plausible explanation as to why a person who does that kind of work could not telecommute. Responses MUST indicate (explicitly or implicitly) that it is necessary to be physically present for the specific work.

- Building. It's hard to work with the wood and bricks from just anywhere.
- Sportsperson. You need to really be there to play the sport.
- Plumber. You can't fix someone else's sink from your home!
- Digging ditches because you need to be there.
- Nursing – it's hard to check if patients are ok over the Internet.



### Comment

This question requires students to generate an example (a profession) that fits a given category. The textual information required for this question is found in the footnote definition of telecommuting. Therefore, although the stimulus is comprised of multiple texts, this question is classified as **continuous** in terms of text format because it only refers to one text element.

To provide an example of a job in which telecommuting would be difficult, students must link their comprehension of the text (the definition of telecommuting) with outside knowledge, since no specific profession is mentioned in the text. This question is therefore classified as **reflect and evaluate**, with the sub-category **reflect on and evaluate the content of a text**.

In order to gain credit for this question, students needed to give an example and to justify why their example fitted the given category, and the explanation needed to refer either explicitly or implicitly to the fact that the worker would need to be physically present in order to perform their job. Although the range of responses eligible for full credit was very wide, many students failed to gain credit because they did not provide an explanation at all, or they gave an explanation that did not show that they understood that the job they listed would require the worker's physical presence. An example of the latter is, "Digging ditches because it would be hard work." Compare this with the credited response, "Digging ditches because you need to be there."

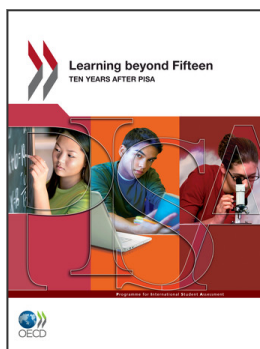
Nearly 60% of students gained full credit for this question.

### Example of a digital reading task

One task from the PISA 2009 assessment of reading of digital texts, comprising four items, is reproduced in this section. Screen shots are used to illustrate parts of the stimulus relevant to each question. The digital version of this unit and other released tasks are available at [www.pisa.oecd.org](http://www.pisa.oecd.org).

## Notes

1. In the Province of Québec, there are only 11 years of compulsory education before students move on to post-secondary studies.
2. This analysis uses a subset of the Canadian PISA students who have never received remedial or enrichment support. Relative proficiency controls for the effects of differences in proficiency between provinces and month of birth within each grade. Although grade level is, strictly speaking, not an interval variable, the consistency of the differences in proficiency between all pairs of adjacent grade levels lends credibility to a quasi-interval interpretation. In other words, a pairwise comparison of differences between adjacent grades would produce approximately the same graph.
3. A similar analysis was undertaken by Willms (2004), who found that for the 12 countries with similar variations in the age cut-off for school registration, the average increase in PISA scores was 34 points per grade level.
4. During late adolescence, a period of increased synaptic pruning occurs in the prefrontal cortex (Paus, 2005; Giedd, et al., 1999; Abitz, et al., 2007) which is the center of language function. In normal development, synaptic pruning renders the brain more efficient by eliminating inefficient neural pathways. Since neuronal efficiency increases with repetitive firing of a pathway, the end result of synaptic pruning is decreased cognitive capacity with infrequently used functions.
5. More precisely, since it is possible to earn partial credit on some items, the item-correct score is the total credit received for a particular question by all participants, divided by the total credit available to all participants. The scores are weighted by the student weights from PISA-24, but all questions are given an equal weight towards the overall average.



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