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ABSTRACT

This report contains details of the results of the Primary Assessment Program conducted in 1991 in urban and non-urban schools in the Northern Territory of Australia. The assessment program, conducted annually at years 5 and 7 in urban schools and at ages 10 years and above in non-urban schools, monitors achievement in English and mathematics. In 1991, nearly 4,000 urban students and 1,700 non-urban students participated in the testing program. Findings reveal a significant improvement in the achievement of urban students in years 5 and 7 in mathematics in 1991 compared with 1990. Fundamental changes in the reading test made it impossible to compare the two years. However, evidence suggests that urban school functional literacy and reading comprehension was good, but was not as good in the non-urban schools, where many students appeared unable to perform satisfactorily in tasks required for Stages 4 and 5 of reading and Stage 4 of mathematics. Results are reported in a format teachers and principals have found easy to understand. Eleven appendixes contain sample questions for the different assessments, information about the test committees, and test statistics. Information about test items, scores, and mean achievement is presented in 26 tables. Score distributions are portrayed in 11 graphs. (SLD)

CURRICULUM AND ASSESSMENT

RESEARCH AND EVALUATION REPORT

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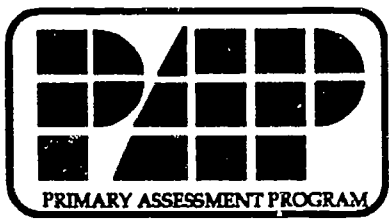

Research and Evaluation Report

REPORT 2/1992

RESULTS OF THE PRIMARY ASSESSMENT PROGRAM FOR 1991 IN URBAN AND NON-URBAN SCHOOLS

PREPARED FOR
THE NORTHERN TERRITORY BOARD OF STUDIES

Northern Territory Department of Education
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FOREWORD

This report contains details of the results of the Primary Assessment Program conducted in 1991 in urban and non-urban schools*. As can be expected, some of the findings are extremely encouraging but others are less so.

As I write this, I recall the public debate regarding standards when the program was launched in urban schools in 1983 and in 1986 in non-urban schools. Even before the emphasis on accountability, the PAP had begun evolving its tests to accommodate accountability and what was actually taught in the classrooms of our schools. As the program evolved, more and more teachers participated in the decision-making processes regarding what should be tested and how. The tests have improved year by year not only in content but in their format and presentation and more recently, in the form that the results are reported to schools. We can now confidently say that when schools make good use of the program they are finding it to be of very considerable benefit.

The findings reveal there was significant improvement in the achievement of urban students in Years 5 and 7 in mathematics in 1991 compared to that in 1990. Because of fundamental changes to the reading tests which occurred in 1991, the report explains that it was not possible to compare reading performance in 1991 with 1990 but this will be possible in the future.

Undoubtedly, there is evidence to suggest that in urban schools at Years 5 and 7, performance in functional literacy and reading comprehension in 1991 was good. Students in non-urban schools succeeded on the reading and mathematics tasks at Stage 3 but many appeared unable to perform satisfactorily in the tasks required at Stages 4 and 5 for reading and at Stage 4 for mathematics.

The report goes into considerable detail in describing performance on individual tasks. In the statistical data reported to schools, teachers are able to evaluate how their students have performed on individual tasks as well as on groups of tasks (subtests). This has been a feature of the PAP that teachers have found to be of great value. Of equal value are the aggregated results for the Territory which teachers have used as benchmarks to judge the performance of their school cohorts.

On behalf of the Northern Territory Board of Studies and the Northern Territory Department of Education, I wish to take this opportunity to thank everyone who has given valuable assistance in making the program a success in the past year. I seek your continuing support and cooperation particularly as we move to incorporate in the program the national profiles under development.

Dr CH PAYNE
Chairman
Northern Territory Board of Studies

* 'Non-urban schools' in this report refers to schools with predominantly Aboriginal enrolment.

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EXECUTIVE SUMMARY

The Primary Assessment Program (PAP), which is conducted annually at Years 5 and 7 in urban schools and at ages ten and above in non-urban schools, monitors achievement in English and mathematics through moderation of school-based assessment of writing and a Territory-wide testing program in reading and mathematics. This report provides detailed information on students' achievement in the reading and mathematics tests which were conducted in both urban and non-urban schools in late 1991. Schools received the results for their students and the Territory at the beginning of Term 1 in 1992.

The statistical data supplied to schools in Term 1 allows schools to evaluate how their students have performed on individual tasks as well as on groups of tasks (subtests). The Territory aggregates are used as benchmarks for comparison.

In 1991, nearly 4000 students in Years 5 and 7 in urban schools and 1700 students aged ten and older in non-urban schools participated in the testing program. Although each year has seen a significant increase in the participation rate from non-urban schools, this still represents only about fifty per cent of the total number in this cohort.

In the mathematics test, the majority of Year 5 students succeeded in number computations but did less well in word problems. Generally, the success rate in the space strand was better than in measurement; a high proportion found calculation of time intervals, surface area and perimeter especially difficult.

The majority of Year 7 students were successful in the number tasks such as numerical computations, word problems, simple fractions and graphs. But a high proportion appeared to have difficulty with aspects of geometry such as three-dimensional shapes, translation and rotation. In measurement, students did better in tasks involving mass and length than in tasks involving volume, time, circumference of a circle and conversion of units.

Analysis of the mathematics results showed that students in Years 5 and 7 performed significantly better in 1991 than in 1990. It was not possible to make a valid comparison for results in reading as significant changes were made to the reading tests in 1991 to bring them into line with the new English curriculum.

Students in non-urban schools sat for the mathematics tests at Stages 3 and 4 of the Board Approved Curriculum (stages are roughly equivalent to year levels). A reasonable proportion succeeded in the basic number tasks but a high proportion still had difficulty with subtraction, multiplication and division. Measurement proved particularly difficult for most. Generally, most were able to demonstrate a fair understanding of basic ideas in space.

In the reading for different purposes tests (functional literacy) for urban schools, the materials presented simulated a newspaper. At both Years 5 and 7, the majority of students succeeded in locating and interpreting information, following directions and using reference skills.

Students in Years 5 and 7 scored an average of seventy per cent on the reading comprehension tests based on prose passages. In reading comprehension, the majority showed that they were able to identify main ideas, locate facts and details, recognise cause and effect, make simple inferences and give meanings to words or phrases.

Students in non-urban schools were given a reading for different purposes test and a comprehension test made up of three subtests at three levels, i.e. Stages 3, 4 and 5 in the curriculum. Generally, most students found the comprehension tests at Stages 4 and 5 very difficult.

The last two years have seen important developments in test construction and reporting of results. A wider range of everyday materials has been included to test functional literacy. Students are exposed to texts from two or three genres requiring a deeper level of understanding for the comprehension tests. In mathematics, the majority of questions involve higher order thinking processes such as understanding and application.

Results are reported in a format which is easier to understand and interpret. At inservices held in 1991 and 1992, teachers and principals were more willing to engage in frank and open discussions about school results so long as they were seen as mutually beneficial.

For the reader with an interest in measurement statistics, the reliabilities of the tests used in 1991 are reported in Appendix XI. The reliability indices for all tests were in the region of 0.90. Test writers have reason to feel pleased with the high reliabilities obtained.

1 INTRODUCTION

Background

The Primary Assessment Program (PAP) is a system-wide assessment program which monitors achievements in English and mathematics for Years 5 and 7 students in urban schools and students aged ten and over in non-urban schools in the Northern Territory. It is conducted annually by the Northern Territory Department of Education Curriculum and Assessment Division under the auspices of the Northern Territory Board of Studies.

The PAP originated in 1982 after the results of NT students in a national testing program (Australian Studies in Student Performance Project) triggered a vigorous public debate on standards. A broadly based working party initiated by the then Minister for Education established the guidelines for the program. In 1983 a system-wide testing program on basic skills was introduced in urban schools for Years 5 and 7 and in 1986 the program was extended to non-urban schools.

Prior to 1988, assessment of achievement in urban schools was based on minimum competencies (core objectives) for reading and mathematics. Since the tests were based on the core objectives and pitched at relatively low levels of difficulty with 'passing' scores of 70% correct for reading and 80% correct for mathematics, most urban students 'passed' the tests and did not find them challenging enough. Many students and teachers, in fact, did not appear to take them seriously. Teachers did not find them particularly helpful, and except for identifying students in the lowest 20% of the scale, the program appeared to serve no useful purpose. It was inevitable that in order to gain acceptance in schools, the test objectives and content had to change. This change was to occur both in test content and skills tested, in terms of their range and complexity.

Since 1988, the focus of the PAP in urban schools for Year 7 has shifted from assessment of performance on the core objectives to assessment on the whole curriculum and in 1989 a similar shift was made for Year 5. In the case of non-urban schools, the testing program was based on minimum competencies expected of students in Year 5 until 1990. In 1991, multilevel tests in both reading and mathematics were introduced in non-urban schools which allowed curriculum objectives at lower stages in the curriculum to be incorporated. However, students in non-urban schools wishing to attempt the urban schools tests were encouraged to do so and a few schools are implementing this.

The program is oversighted in policy matters by the Primary Assessment Committee of the Board of Studies. Changes to the Primary Assessment Program are continually being made in response to recommendations from the writing panels and suggestions made by principals and teachers at inservice activities. The program has won wide acceptance and recognition in NT schools in recent years and was endorsed as a project of national significance by the then Australasian Co-operative Assessment Program (ACAP), a national steering committee sponsored by the Conference of Directors-General.

Aims of the Program

The general aim of the PAP testing program is to monitor student performance system wide in some aspects of language and mathematics and to report school and system results on the tests. In more specific terms, the aims may be summarised as follows:

- at the classroom level, to provide test results of individual students in reading and mathematics to assist learning
- at the school level, to provide test data which would allow schools to compare both individual and group, i.e. school cohort results with the Territory aggregates
- at the system level, to provide test data on achievement in reading and mathematics across the Territory and detect trends
- at both the school and system levels, to give indications of areas of strength and weakness in reading and mathematics
- to provide schools with a bank of high quality assessment materials over a period of time.

The PAP Tests

The PAP consists of four components: mathematics tests, reading comprehension tests, reading for different purposes tests and writing moderation exercises. The reading and mathematics tests for urban and non-urban schools are administered annually. The tests are constructed by teams of experienced teachers and office-based staff. The results of the writing moderation exercises carried out annually are not included in this publication but are provided in separate publications.

Writing is assessed in urban and non-urban schools every year by moderation of teacher-assessed sample scripts sent in from schools. Schools are required to return samples of students' writing in any one year from two genres, e.g. argument and explanation, in accordance with procedures outlined in advance. The samples are examined by a team of experienced teachers and office-based staff and graded as showing 'high', 'medium' or 'low' competence. The results are produced in a booklet which contains a checklist of 'descriptors' for assessing quality in key aspects of writing and includes samples of students' work showing grades and comments.

Tests for non-urban schools are written by teachers and office-based staff with experience in teaching in non-urban schools. The test-writing panels put in a great deal of time and effort to ensure that the test materials have meaning and relevance for Aboriginal students. A lot of attention is given to checking that materials are not culture biased as these would put students at a disadvantage. Whilst it is recognised that it is not possible to construct a test which is absolutely culture free, the tests to be used in non-urban schools need to be as culture fair as possible. The use of Aboriginal stories, folklore and reading matter familiar to Aboriginal children and the attention given to the choice of materials and test construction have resulted in the creation of a distinctive testing program for non-urban schools.

A test specification chart is employed for generating items. The chart at the same time provides a check on the number of items constructed for each of the content areas and abilities or skills involved. To give an example, in mathematics, approximately half of all questions relate to number and number relations and a substantial number of these measure understanding and applications of concepts while only a small number test recall.

Before the tests are finalised, the questions are field-trialled in a sample of schools and analysed to improve their quality. Each question is examined for relevance to the content area; indices of difficulty, discrimination and reliability are calculated using traditional test theory. Some items are discarded without any further work done on them; many need modification after the review by the test writers. The procedures used in the item analysis are designed to ensure that the tests are valid in terms of their relevance to both the curriculum content and classroom instruction, that they discriminate between able and less able students and that they have high reliability.

All test answer sheets are returned to Curriculum and Assessment for processing and analysis. Diagnostic information is extracted for use by both the school and system to assist student learning. Principals and teachers participate in inservices where the PAP tests and results are discussed.

The test results are reported and returned to schools after the completion of the program every year. Each school receives its own students' results and the Territory results for comparison. All individual and school results are treated confidentially and the public report of Territory-wide results does not include results of individual students or schools.

A statistical analysis is carried out to compare system performance year by year. This is done by using 'link' items i.e. a sample of common items used from one year to the next.

Three statistical reports are produced for the school and Territory.

Report 1: Percentage Correct on Each Item

This report shows the percentage of students in the school and Territory cohorts answering each question correctly. The items are ranked in order of difficulty for the Territory cohorts. It allows each school to compare performance of its students with that of the Territory item by item. The report has been found to be particularly useful in identifying the strengths and weaknesses of students within a school as well as across the Territory.

Report 2: Distribution of Test Scores

This report shows the raw scores and percentages obtained by individual students on each test in a particular school. The distribution of raw scores for Territory students is also provided for each of the tests. The report enables a student's status (ranking) in relation to the Territory population to be readily checked on any test.

Report 3: Means for Subtests

In this report, the means and standard deviations for subtests within each subject are generated for both the school and Territory cohorts allowing comparisons to be made. The report enables the school and the system to identify specific areas in the curriculum which may need further attention. Furthermore, a statistical test is carried out to determine if the means for the school and Territory are significantly different.

The school reports have generated a great deal of interest in recent years. Suggestions have come from schools as to how they would like to see the results presented. Changes have already been incorporated for inclusion in 1992 which should make the results more easily understood and interpreted. At inservice sessions held early in 1992, many schools participated in open and frank discussions about their own school results within the rules governing the confidentiality arrangements. This is an indication of the degree of maturity which the PAP has attained in recent years and it is a healthy sign.

2 RESULTS OF YEAR 5 MATHEMATICS

Introduction

In urban schools, the mathematics test for Year 5 was designed to assess achievement at Stage 5 of the Board of Studies approved WA Mathematics Syllabus. The test comprised sixty items covering the following strands: space, number and measurement, giving a total of sixty marks.

Questions were set in both the open-ended and multiple-choice format. The tasks required the recall of basic facts, computation, understanding of concepts and mathematical ideas and applications of concepts. The distribution of items and the relative weighting in the various content areas were determined by the test-writing panel with the help of a test specification chart for generating items.

The results on individual items obtained from the testing program were grouped into three categories of difficulty: easy, moderately difficult and very difficult. Items answered correctly by less than 40% of students were classified as very difficult, between 40% and 70% as moderately difficult and by more than 70% of students as easy.

The distributions of item difficulties and test scores are included in this chapter. Also included are the means and standard deviations for the various subtests.

An analysis of performance on the link items (common items) between 1990 and 1991 was carried out to determine if there was any significant change from one year to the next.

A t-test of significance between means for correlated data was used to test whether differences on the link items were significant. This test considered data from individual items, using proportion correct values. It is a more sensitive test than the usual t-test between means as it uses data from all items. As four items used in 1990 were not included in 1991 estimates of proportion correct were calculated for these. Graph 2.2 illustrates performance on the link items between 1990 and 1991.

Year 5 Mathematics Results

The Year 5 mathematics test covered an extensive range of tasks involving many of the important concepts in number, measurement and space expected of Year 5 students. Performance was generally satisfactory; the sixty-item test had an overall mean of 34.68.

Certain trends were evident. Students performed slightly better on items in the space and number strands than in measurement (Table 2.3).

In the number strand, most students were able to extract information from a table (item 29), identify even numbers (item 20), perform simple multiplication (items 5, 15 and 19) and addition (items 25, 38) and interpret line and bar graphs (items 45, 53). However, a substantial proportion of students had difficulty with division (items 17, 22 and 47), place values (items 4, 37 and 57), prime number (item 11) and problems on money (items 3, 17). The majority of students were able to add fractions with the same denominator (item 32) but quite a high proportion were unable to solve equivalence of fractions (items 16, 31).

Students did well in the space strand except for the following areas, i.e. count the number of edges of a rectangular prism (item 1), locate coordinates of points on a grid (item 6) and follow compass directions (item 51). Most students appeared to have a good understanding of three-dimensional shapes (item 48), symmetry (items 10, 21) and surprisingly, many students were able to work out linear transformations such as dilation (item 55) and rotation (item 12).

Students found several items in measurement difficult. However, the majority of students did not appear to have problems in dealing with metric units of mass (item 13), volume (items 30, 39, 43, 50 and 54) and distance (items 33, 36 and 56). Most students were able to measure the perimeter of a polygon (item 18), but failed to solve an application problem on the perimeter (item 59). A considerable number of students had difficulty with calculation of surface area (item 27) and time intervals (item 34).

Percentage Correct on Items

A total of 1924 students did the test. As shown in Table 2.1, only thirteen items were in the very difficult category compared to twenty-seven items in the easy category and twenty items in the moderately difficult category. Over 90% of students answered correctly questions 10, 29, 41 and 48. Most students found questions 34, 44 and 59 difficult; less than 20% of the students responded correctly to these questions. A sample of ten items across a range of difficulty values is included in Appendix II.

Table 2.1: Difficulty of Items: Mathematics Year 5

% Answered correctly	Difficulty	Number of Items
70 – 100%	Easy	27
40 – 69%	Moderately difficult	20
< 40 %	Very difficult	13
Total		60

Distribution of Test Scores

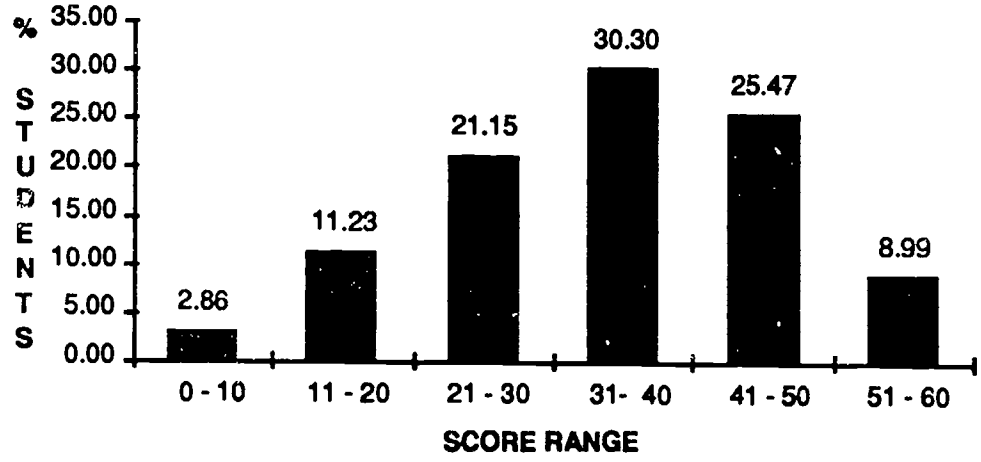
Table 2.2 shows that 2.86% of students scored 0 – 10 in the sixty-item test, while 8.99% gained the top range of 51 to 60. The majority of students scored between 31 and 50. It is noted that 64.76% of all students attained scores of more than 30 compared with 35.24% of students who scored below 30. It is of interest to note that the highest score was 59 (3 students) and no student obtained 60/60 and the lowest score was zero (5 students).

Table 2.2: Distribution of Scores: Mathematics Year 5

Score Range	Number of Students	% of students
0 – 10	55	2.86
11 – 20	216	11.23
21 – 30	407	21.15
31 – 40	583	30.30
41 – 50	490	25.47
51 – 60	173	8.99
Total	1924	100.00

As shown in Graph 2.1, the results of the Year 5 mathematics test seem to approach a normal distribution, except that it is slightly skewed. A higher proportion of students obtained scores greater than the half-way mark.

Graph 2.1: Distribution of Scores: Mathematics Year 5



Means for Subtests

Although the size of the standard deviations indicates that individual scores varied considerably, the mean scores of the subtests were quite similar, i.e. means for the subtests were between 50% and 60%. However the mean for graphs/statistics fell below 50% of the number of items (Table 2.3).

Table 2.3: Means on Subtests: Mathematics Year 5

Subtest	Number of Items	Means	Standard Deviations
Number	14	8.35	3.36
Number relations	18	11.02	3.58
Measurement	15	8.19	3.22
Space	10	5.83	2.39
Graphs/Statistics	3	1.30	0.92
Total Test	60	34.68	11.95

More than 50% of questions in number, number relations and space strands were found to be in the easy category. It was evident that most students found measurement difficult as shown by the majority of items in this strand falling into the moderately difficult and very difficult categories (Table 2.4). It is hard to make a statement about graphs and statistics as there were only three questions in this subtest.

Table 2.4: Difficulty of Items by Subtests: Mathematics Year 5

	Number of Items			
Subtest	Easy	Moderate	Very Difficult	Total
Number	7	5	2	14
Number relations	9	6	3	18
Measurement	4	8	3	15
Space	6	1	3	10
Graphs/Statistics	1	0	2	3
Total Test	27	20	13	60

Comparison

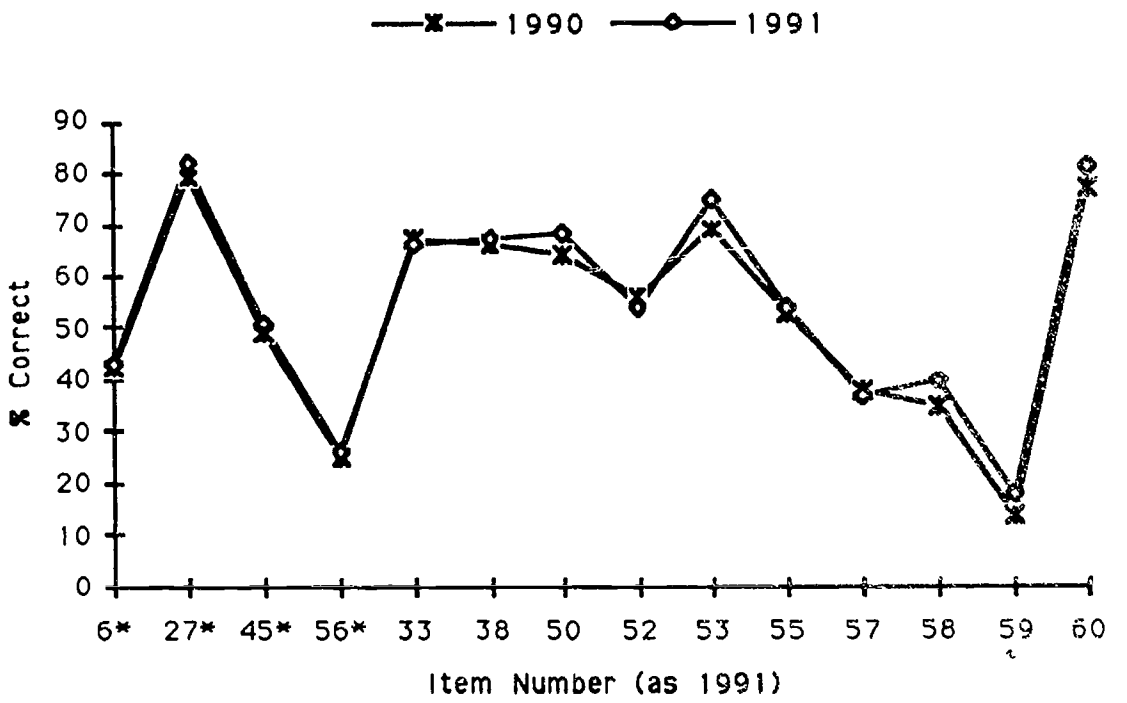
Table 2.5 shows the results based on proportion correct for the link items for 1990 and 1991. The first four items in the table were dropped in 1991, hence figures in brackets for 1991 were estimates of proportion correct for these items. A t-test between means for correlated data on the link items shows a significant improvement in performance in 1991 compared with 1990.

Table 2.5: Comparison Between 1990 and 1991 Performance: Mathematics Year 5

Item No. (as in 1991)	Proportion correct	
	1990	1991
Est (1990 qn 6)	0.42	(0.43)
Est (1990 qn27)	0.79	(0.82)
Est (1990 qn45)	0.49	(0.51)
Est (1990 qn56)	0.25	(0.26)
33	0.67	0.66
38	0.66	0.67
50	0.64	0.66
52	0.56	0.54
53	0.69	0.75
55	0.53	0.54
57	0.38	0.37
58	0.35	0.40
59	0.14	0.18
60	0.77	0.81
Mean	0.52	0.54
Std Deviation	0.20	0.20
No. of Students	1919	1924
Correlation		**0.99**
t-value		**3.06**
critical value (df=26)		**2.056**
R0 : If |t|>2.056 then reject the null hypotheses i.e. significant		

The following graph shows more clearly the performance in 1990 and 1991 on each of the link items. Proportion correct figures for most items were higher in 1991. The correlation for the link items between the two years was very high (r=0.99, Table 2.5).

Graph 2.2: Comparison on link items: Mathematics Year 5



NB: * indicates these items were dropped in 1991; the values shown on the graph were estimated values.

3 RESULTS OF YEAR 7 MATHEMATICS

Introduction

In urban schools, the mathematics test for Year 7 was designed to assess achievement at Stage 7 of the WA Mathematics Syllabus approved by the Board of Studies. The test comprised sixty items covering the following strands: space, number and measurement.

Questions were set in both the open-ended and multiple-choice format. The tasks required students to demonstrate recall of basic facts, computation, understanding of concepts and mathematical ideas and applications of concepts. The distribution of items and relative weighting in the various content areas were determined by the test-writing panel with the help of a test specification chart for generating items.

As for Year 5, the results on individual items from the testing program were grouped into three categories of difficulty: easy, moderately difficult and very difficult. Items answered correctly by less than 40% of students were classified as very difficult, between 40% and 70% as moderately difficult and by more than 70% of students as easy.

The distributions of item difficulties and test scores are included in this chapter. Also included are the means and standard deviations for the various subtests.

An analysis of performance on the link items (common items) between 1989, 1990 and 1991 was carried out to determine if there were any significant changes from one year to the next.

A t-test between means for correlated data was used to determine whether differences on the link items from one year to the next were significant. This test of significance considered data from individual items, using proportion correct values. It is a more sensitive test than the t-test between means as it uses data from all items. Estimates of proportions correct were made to produce comparisons for three items included in 1989 and 1990 but not in 1991, and three items included in 1990 and 1991 but not in 1989. Graph 2.2 illustrates performance on the link items between 1990 and 1991.

Year 7 Mathematics Results

The Year 7 mathematics test consisted of three strands, namely measurement, number and space. Overall performance was satisfactory and the sixty-item test had a mean of 32.71.

The majority of students were successful on the tasks in the number strand. Most students were able to solve simple word problems (items 3, 23), perform arithmetical operations in addition (item 31), multiplication (item 1) and division (items 5, 35), identify prime numbers (item 2), complete a logical sequence (item 29), express a fraction as a percentage (item 4), simplify equivalence of fractions (items 7, 56), calculate rates (item 55), and interpret line, pie, bar and pictorial graphs (items 14, 25, 44 and 10). However, more than 50% of students had difficulty with simplifying improper fractions (items 21, 37), rounding (item 6) and applying order of operations (item 38). A high proportion of students were able to calculate the average age of four people (item 16) but only a few could give the age range (item 17).

Students found items on space relatively difficult. The majority of students were successful in using a metric unit scale (item 50), counting the number of possible paths from one point to another (item 59), identifying a scalene triangle (item 18) and solving the interior angles of a triangle (item 49). A considerable number of students had difficulty with counting the number of pairs of congruent triangles in a parallelogram (item 20), locating points in the four quadrants (item 57), determining the number of faces, edges and vertices of a prism (item 24), identifying planes of symmetry in a rectangular prism (item 53) and working out linear transformations such as dilation (item 39) and rotation (item 51).

In the measurement strand, most students were successful in dealing with mass (item 12), perimeter (item 43) and interpreting distance on a map (item 19). Items in the vicinity of 50% correct were in the calculation of volume (items 28, 45), finding time intervals (item 27), finding circumference (item 15) and area of triangles (items 30, 58), interpreting a flight schedule (item 11), and converting metres to centimetres and vice versa (item 13). About a third of the students were able to calculate time intervals in a word problem (item 54) and find the area (item 46) and perimeter (item 47) of a composite shape.

Percentage Correct on Items

A total of 1853 students took the test. As shown in Table 3.1, eleven items were located in the easy category, thirty-six items in the moderately difficult category and thirteen items in the very difficult category. Students experienced least difficulty with questions 3 and 12, with over 85% of students answering them correctly. Questions 53 and 48 were the most difficult questions in the test with 25.53% and 26.71% of students respectively giving the right answers. A sample of ten items across a range of difficulty is included in Appendix III.

Table 3.1: Difficulty of Items: Mathematics Year 7

% Answered correctly	Difficulty	Number of Items
70 – 100%	Easy	11
40 – 69%	Moderately difficult	36
< 40 %	Very difficult	13
Total		60

Distribution of Test Scores

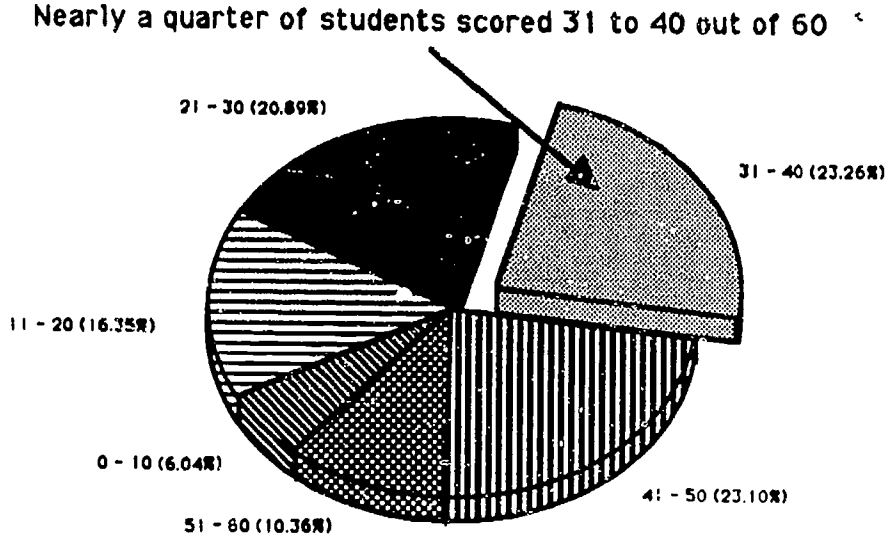
Table 3.2 shows that 6.04% of students scored 10 or lower in the sixty-item test, while 10.36% of students gained the top range of 51 – 60. The majority of students scored between 21 and 50. About 57% of all students attained scores more than 30 compared with 43% who scored below 30. It is of interest to note that four students obtained the maximum score of 60.

Table 3.2: Distribution of Scores: Mathematics Year 7

Score Range	Number of Students	% of students
0 – 10	112	6.04
11 – 20	303	16.35
21 – 30	387	20.89
31 – 40	431	23.26
41 – 50	428	23.10
51 – 60	192	10.36
Total	1853	100.00

As shown in Graph 3.1, nearly a quarter of the population scored in the range 31 – 40 (23.26%); the majority of students scored in the range 21 – 50 (67.25%).

Graph 3.1: Distribution of Scores: Mathematics Year 7



Means for Subtests

The size of the standard deviations demonstrates that individual scores varied considerably. However the means for the subtests were quite similar (Table 3.3).

Table 3.3: Means on Subtests: Mathematics Year 7

Subtest	Number of Items	Means	Standard Deviations
Number	14	8.20	3.33
Number relations	12	6.38	2.78
Measurement	16	8.33	4.21
Space	11	6.50	3.15
Graphs/Statistics	7	3.31	1.79
Total Test	60	32.71	13.74

For all subtests, most questions were in the moderately difficult category. Students found questions associated with graphs/statistics, measurement and number relations slightly harder than questions associated with number and space (Table 3.4).

Table 3.4: Difficulty of Items by Subtests: Mathematics Year 7

	Number of Items			
Subtest	Easy	Moderate	Very Difficult	Total
Number	4	8	2	14
Number relations	3	5	4	12
Measurement	2	10	4	16
Space	2	8	1	11
Graphs/Statistics	0	5	2	7
Total Test	11	36	13	60

Comparison

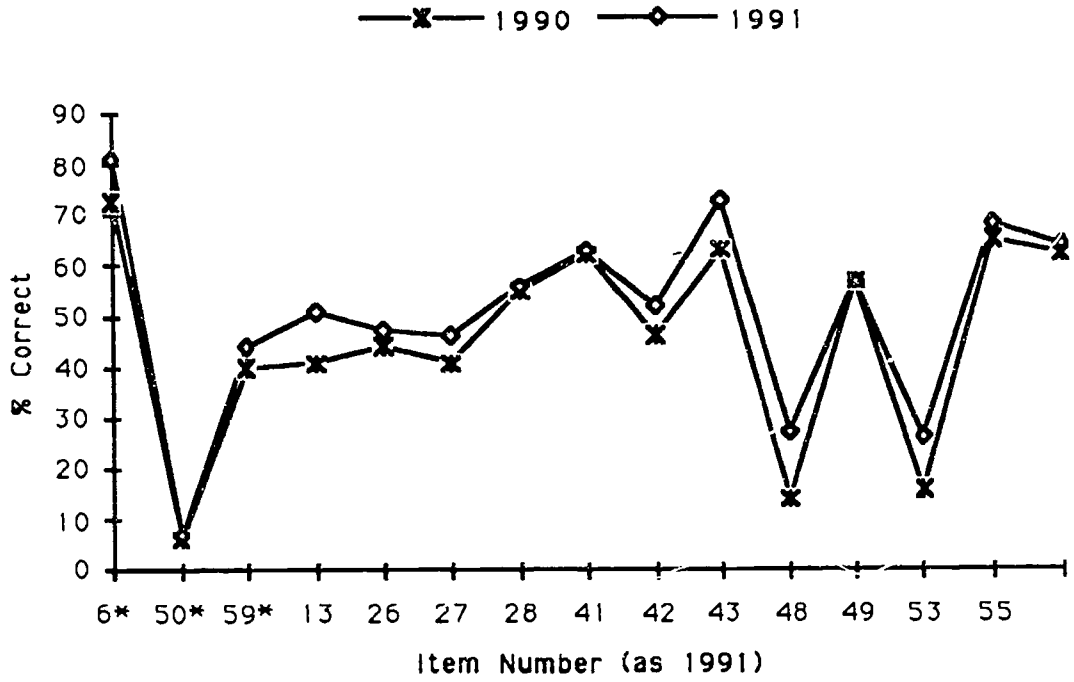
Table 3.5 shows the results on the link items for 1989, 1990 and 1991. The first three items in the table were dropped in 1991; figures in brackets for 1991 were estimates of proportion correct for these items; the last three items did not appear in 1989; figures in brackets for 1989 were estimates. As shown in the table, there was no change in performance between 1989 and 1990 but a t-test between means for correlated data shows a significant improvement in 1991 compared with performance in 1989 and 1990.

Table 3.5: Comparison between 1989, 1990 and 1991 Performance: Mathematics Year 7

Item No. (as in 1991)	Proportion correct		
	1989	1990	1991
Est (1990 qn 6)	0.68	0.73	(0.81)
Est (1990 qn50)	0.05	0.06	(0.07)
Est (1990 qn59)	0.4	0.40	(0.44)
26	0.43	0.44	0.47
27	0.4	0.41	0.46
28	0.56	0.55	0.56
41	0.63	0.62	0.63
42	0.48	0.46	0.52
43	0.66	0.63	0.73
49	0.58	0.57	0.57
55	0.66	0.65	0.68
56	0.63	0.62	0.64
13	(0.42)	0.41	0.51
48	(0.14)	0.14	0.27
53	(0.16)	0.16	0.26
Mean	0.46	0.46	0.51
STD Deviation	0.20	0.20	0.19
No. of Students	1797	1850	1853
Correlation		**0.99**	**0.98**
t-value		**0**	**4.71**
critical value (df=28)		**-**	**2.05**
R0 : If |t|>2.048 then reject the null hypothesis i.e. significant			

The following graph compares the performance between 1990 and 1991 on each of the link items. It shows remarkably consistent gains in 1991 for the majority of link items.

Graph 3.2: Comparison on the Link Items: Mathematics Year 7



NB: * indicates these items were dropped in 1991, the values shown on the graph were estimated values.

4 NON-URBAN SCHOOLS MATHEMATICS TESTS

Introduction

The mathematics test for non-urban schools was based on Stages 3 and 4 of the Board approved Western Australia Mathematics Syllabus and was intended to measure knowledge and skills related to these stages. It was the first year in which the test was set for two stages. The test comprised sixty items covering the following strands: space, number and measurement, and each strand covered two stages. As in the urban schools testing program, the questions were set in both the open-ended and multiple-choice format. It was different from the test for urban schools in that there was no time limit for completing the test. There was also a practical test but results from the latter are not reported here.

The results on individual items were grouped into three categories of difficulty: easy, moderately difficult and very difficult. Items answered correctly by less than 40% of students were classified as very difficult, between 40% and 70% as moderately difficult and by more than 70% as easy.

The distribution of students in the various score ranges is included in this chapter. Also included are the means and standard deviations for the various subtests.

Non-urban Schools Mathematics Results

The mathematics test which included subtests at two stages, covered basic concepts in number, measurement and space. As expected, performance on the subtest at Stage 3 was better than that at Stage 4. The overall mean was 26.4 for the sixty-item test.

In the number strand, most students were able to add without regrouping (item 48), solve simple word problems (items 8, 15, 18 and 44), interpret a bar graph (items 5, 6) and shade in a given fraction (item 7). Students were able to identify the smallest integer (item 2), extract information from a table on money (item 40) and identify place values (item 4, 47). However, the majority had difficulty with subtraction (items 42, 60), addition with regrouping (item 37), division (items 10, 32), multiplication (items 28, 33, 45 and 51), identifying multiples of 7 from a table (item 22) and chance (item 9).

The majority of students did not perform well in measurement. In many areas, most students were unsuccessful. Although a considerable number of students were able to read digital and twelve-hour clocks (items 26, 36), measure a straight line (item 23) and circle the shape with the longest perimeter (item 3), most students could not read a calendar (item 14 and 49), identify the shape with the largest area (item 31), draw a rectangle with a given area (item 13), give the number of hours in a day (item 12), or calculate how many lots of five minutes in half an hour with the aid of a twelve-hour clock face (item 30). Also, many students had problems in dealing with metric units (item 17), calculation of volume (item 43) and solving word problems such as how many 100 gram chocolate bars in 1 kilogram (item 55).

Generally speaking, most students were able to demonstrate a fair understanding of the basic concepts in space, but did not seem to be able to use the concepts to solve problems. For instance, many students were able to do a simple rotation (item 34) but could not do the rotation on a slightly more complicated shape (item 24). Similarly, most students were able to draw an object in a given direction (item 19), e.g. east of a stated object, but failed to name the correct place north of a health clinic on a given map (item 20). The majority of students were able to locate objects in a grid (item 53), complete a pattern of shapes (item 1) and move from one point to another in a maze (item 59). Only a minority could identify three-dimensional shapes (item 50), show the difference between straight edges and curved edges (item 46), count cubic blocks to determine volume (item 38) and demonstrate an understanding of symmetry (item 21).

Percentage Correct on Items

Altogether 1713 students took the test. As shown in Table 4.1, only four items were in the easy category compared to twenty-four items in the very difficult category and thirty-two items in the moderately difficult category. Over 75% of students answered questions 34 and 59 correctly. Most students found questions 10, 17 and 55 difficult with less than 11% of the students responding correctly to these questions. A sample of ten items across the categories of difficulty is included in Appendix IV.

Table 4.1: Difficulty of Items in Mathematics: Non-urban Schools

% Answered correctly	Difficulty	Number of Items
70 - 100%	Easy	4
40 - 69%	Moderately difficult	32
< 40 %	Very Difficult	24
Total		60

Distribution of Test Scores

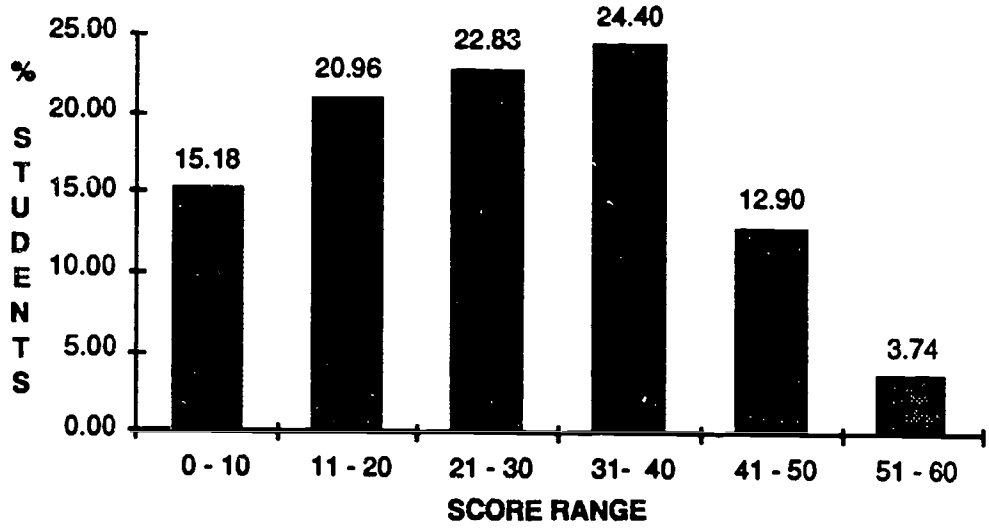
Table 4.2 shows that 15.18% of students scored 10 or less in the sixty-item test, while 3.74% of students obtained scores in the top range of 51 to 60. The majority of students scored between 21 and 40. Scores of more than 30 were attained by only 41.04% of all students. No student attained the maximum score of 60. The highest score was 58 (two students) and the lowest score was zero (seventeen students).

Table 4.2: Distribution of Scores in Mathematics: Non-urban Schools

Score Range	Number of Students	% of students
0 – 10	260	15.18
11 – 20	359	20.96
21 – 30	391	22.83
31 – 40	418	24.40
41 – 50	221	12.90
51 – 60	64	3.74
Total	1713	100.00

As shown in Graph 4.1, the scores on this test tend towards the lower values.

Graph 4.1: Distribution of Scores in Mathematics: Non-urban Schools



Means for Subtests

The size of the standard deviations demonstrates that individual scores varied considerably. As expected, the means for Stage 3 items were relatively higher than those for Stage 4 items.

Table 4.3: Means on Subtests in Mathematics: Non-urban Schools

Subtest	Number of Items	Means	Standard Deviations
Measurement Stage 3	7	3.38	1.78
Measurement Stage 4	7	1.62	1.42
Number Stage 3	16	8.33	4.60
Number Stage 4	18	7.08	4.68
Space Stage 3	3	1.97	0.88
Space Stage 4	9	4.01	2.19
Total Test	60	26.40	13.60

Students appeared to have difficulty in handling the tasks at Stage 4. Stage 3 items were relatively easier especially items relating to space. Two out of three questions fell in the easy category and none in the very difficult category.

Table 4.4: Difficulty of Items by Subtests in Mathematics: Non-urban Schools

	Number of Items			
Subtest	Easy	Moderate	Very Difficult	Total
Measurement Stage 3	1	4	2	7
Measurement Stage 4	0	1	6	7
Number Stage 3	0	14	2	16
Number Stage 4	0	8	10	18
Space Stage 3	2	1	0	3
Space Stage 4	1	4	4	9
Total Test	4	32	24	60

5 URBAN YEAR 5 READING TESTS

Introduction

Two reading tests were administered to Year 5 students in urban schools: one comprehension test and one reading for different purposes test (RDP). The tests included questions in both the multiple-choice and open-ended format. Students were expected to complete each test within forty-five minutes.

The comprehension test contained forty items and the reading for different purposes test had thirty-three items. The prose passages used in the tests to measure comprehension were selected from materials which were likely to be encountered in the classroom. The comprehension test required students to recognise significant ideas, arrange events in sequence, locate specific details and facts, give meaning to words in context, make judgements from given facts, draw conclusions, identify character attributes and determine the cause of events.

Reading materials found in daily life (environmental text) were used in the reading for different purposes test, for example, a newspaper advertisement or a tourist guide. Students were required to locate information, follow directions, use reference skills and interpret information from a variety of sources. The reading materials were presented in the form of a newspaper.

The comprehension test comprised three subtests: report (P1REP), explanation (P2EXP) and narrative (P3NAR).

The results on individual items were grouped into three categories depending on their degree of difficulty: easy, moderately difficult and very difficult. Items answered correctly by less than 40% of students were classified as very difficult, by more than 70% of students as easy, and by 40% to 70% as moderately difficult.

The distribution of students in the various score ranges on both tests is included in this chapter.

A table of means and standard deviations for subtests and the total test is provided.

No comparison in performance could be made between results in 1991 and those of previous years as materials used earlier were dropped from the testing program. The comprehension tests in 1991 had many more items than any comprehension tests administered previously.

Year 5 Reading Tests Results

The Year 5 reading tests results were encouraging. The overall means for the forty-item comprehension test (UR5C91) and the thirty-three-item reading for different purposes test (UR5R91) were 26.81 and 24.05 respectively.

In the reading for different purposes test (RDP), most students had no difficulty in answering questions relating to the Territory Wildlife Park (items 1 to 5), Microwave Hamburgers Recipe (items 6 to 12), Darwin Cinema Guide (items

13 to 16), the Darwin Crocodile Farm (items 17 to 20) and Today's Television Guide (items 31 to 33). There were only two questions in the whole test where the majority was unsuccessful. Item 21 required students to find the missing 'guide words' of a dictionary page, while item 29 asked students to choose a period of time when the 'Golden Moon' take-away restaurant was not operating. Perhaps, it could have been a different result if the question had asked for hours when the restaurant was operating.

The comprehension test had three passages which covered report, explanation and narrative genres.

Passage one was an article on the Australian wild dog, the 'DINGO'. Most students were able to locate details and facts (items 1, 2, 3, 13 and 15), identify the main idea of a paragraph (items 9, 10 and 11), give the meaning of words (item 7), recognise the writer's purpose (item 8), understand the generic 'the' (item 14), and determine the meanings of words from contextual clues (item 5). Although a large number of students were capable of making a simple inference on the basis of facts (item 6), about half of all students failed when the inference to be made was slightly more complex (item 12).

Passage two was an explanatory passage which described how human beings breathe. The majority of students had no difficulties with locating facts and details directly (items 16, 18, 19 and 22), understanding the main idea of the text (item 23), recognising implied meanings (item 26) and determining the meanings of words (item 27). However, less than 50% of all students were able to interpret and understand details (item 17) or provide a comparison (item 20).

Passage three was a story about a shepherd boy who cried 'WOLF'. Most students were able to locate facts and details (items 28, 29 and 30), identify the main idea of a paragraph (item 35), make inferences on the basis of facts (items 39, 40), draw a conclusion based on evidence from the text (items 33, 36) and determine the meaning of words from contextual clues (item 32). Slightly more than half of all students were able to recognise the relationship between the story and the physical setting (item 38), but only a small proportion of students could infer who was telling the story (item 34) or count the number of times a particular event appeared in the passage (item 31). (However, there was a problem with the question itself in item 34 as there appeared to be more than one correct answer.)

Percentage Correct on Items

There were 1892 students who sat the reading comprehension test. As shown in Table 5.1, only 4 items were in the very difficult category compared to twenty-four items in the easy category and twelve items in the moderately difficult category. Over 86% of students answered questions 1, 7, 10 and 28 correctly. Most students found questions 20, 31 and 34 difficult with less than 27% of all students responding correctly. Question 31 required students to count the number of times a specific event appeared in the passage. A sample of items is included in Appendix V.

A total of 1877 students took the reading for different purposes test. About 67% (twenty-two items) of the questions fell in the easy category compared with only 3% (one item) in the very difficult category. The most difficult question was item 21 which was answered correctly by 23.44% of students. Question 21 required students to know how to use 'guide words' in the dictionary. Students had least difficulty with questions number 8 and 26 in which more than 90% of all students got the correct answers. A sample of items is included in Appendix VI.

Table 5.1: Difficulty of Items: Reading Tests Year 5

% answered correctly	Difficulty	Comprehension UR5C91	Different Purposes UR5R91
70 – 100%	Easy	24	22
40 – 69%	Moderately difficult	12	10
< 40 %	Very difficult	4	1
Total		40	33

Distribution of Test Scores

The results show that in the comprehension test 1.11% of all students scored 5 or less compared to 7.14% of all students who scored in the uppermost range of 36 – 40. There were 80.71% of students who achieved more than 20 out of 40. Although the majority of students performed very well in the test, no student obtained full marks. The highest score was 39 (six students) and the lowest score was zero (eight students).

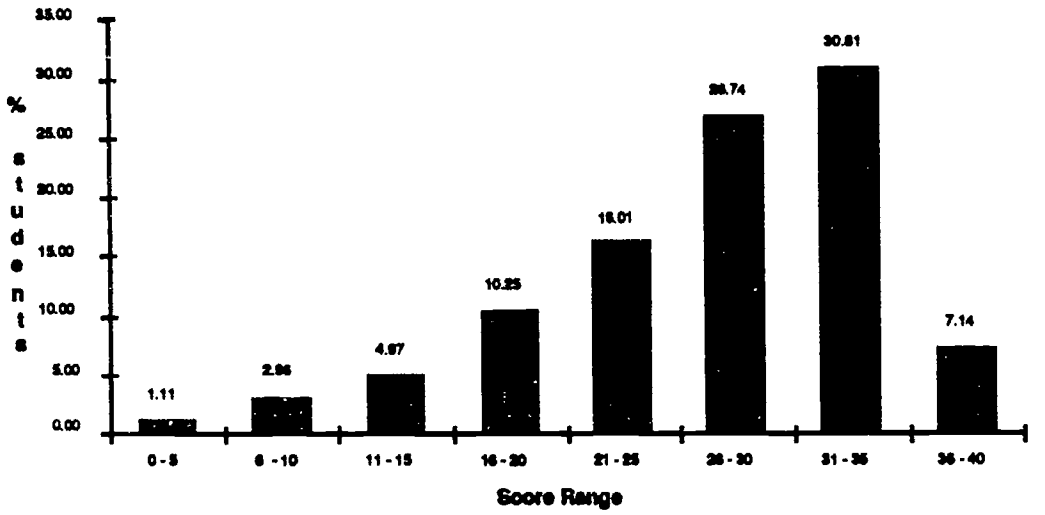
The reading for different purposes test comprised thirty-three items. A score of five or less was achieved by 1.39% of students, while 13.64% of students scored the top range of 31 – 33. Most students scored between 26 – 30. The highest score was 33 (twenty-five students) and the lowest score was zero (eight students).

Table 5.2: Distribution of Scores: Reading Year 5

COMPREHENSION (UR5C91)			FUNCTIONAL PURPOSES (UR5R91)		
Score Range	No. of Students	% of students	Score Range	No. of Students	% of students
0 – 5	21	1.11	0 – 5	26	1.39
6 – 10	56	2.96	6 – 10	71	3.78
11 – 15	94	4.97	11 – 15	123	6.55
16 – 20	194	10.25	16 – 20	238	12.68
21 – 25	303	16.01	21 – 25	453	24.13
26 – 30	506	26.74	26 – 30	710	37.83
31 – 35	583	30.81	31 – 33	256	13.64
36 – 40	135	7.14			
Total	1892	100.00	Total	1877	100.00

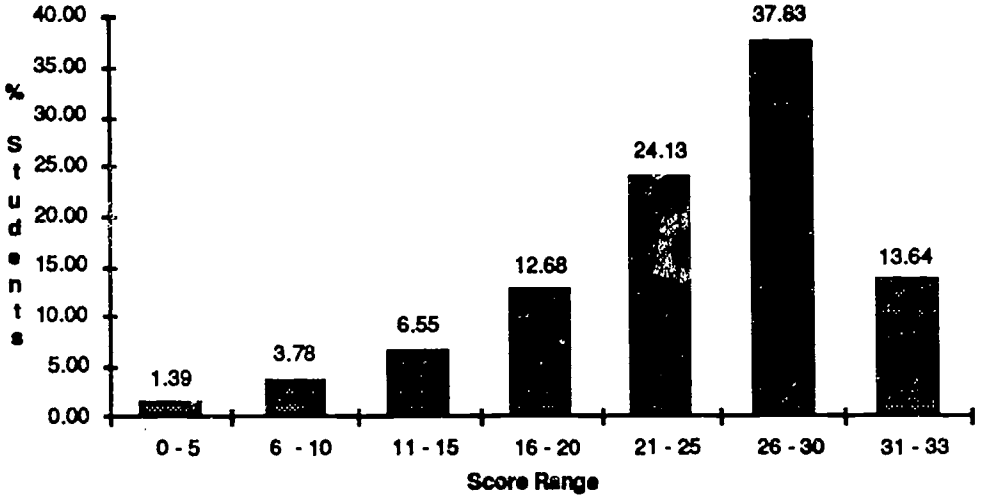
As shown in Graph 5.1, the distribution of the results is highly skewed, suggesting that most students found the test relatively easy.

Graph 5.1: Distribution of Scores: Comprehension Year 5



As shown in Graph 5.2, the distribution of the results for the reading for different purposes test is similar to that for the comprehension test. From the two graphs, Graph 5.1 and 5.2, it is clear that most Year 5 students did well in the two reading tests.

Graph 5.2: Distribution of Scores: RDP Year 5



Means for Reading Tests

The size of the standard deviations once again demonstrates that individual scores varied considerably for both the comprehension (UR5C91) and reading for different purposes (UR5R91) tests. The mean scores for both tests were encouraging.

Table 5.3: Means on Reading Tests: Year 5

TEST CODE	No. of Items	MEANS	STD DEV	No. of students
UR5C91	40	26.81	7.52	1892
UR5R91	33	24.05	6.67	1877

As shown in Table 5.4, the means expressed as percentages of the number of items corresponding to report (P1REP), explanation (P2EXP) and narrative (P3NAR) were 75.86%, 59.83% and 63.38% respectively. The table also indicates that students performed better on questions on the report than on the other genres.

Table 5.4: Means on Subtests: Comprehension Year 5

TEST (UR5C91)	No. of Items	MEANS	STD DEV	No. of students
REPORT (P1REP)	15	11.38	3.02	1892
EXPLANATION (P2EXP)	12	7.18	2.84	1892
NARRATIVE (P3NAR)	13	8.24	2.74	1892
TOTAL	40	26.81	7.52	1892

6 URBAN YEAR 7 READING TESTS

Introduction

One comprehension test and one reading for different purposes test (RDP) were set for Year 7 students in urban schools. The tests included questions in both the multiple-choice and open-ended formats. Students were expected to complete each test within forty-five minutes.

The comprehension test contained thirty-nine items and the reading for different purposes test had thirty-five items. Their readability levels had been trial tested and carefully considered by the panel of teachers who developed the tests.

The comprehension test comprised three subtests, narrative (P1NAR), explanation 1 (P2EXP) and explanation 2 (P3EXP). The prose passages used in the test to measure comprehension were selected from materials normally encountered in the classroom. The comprehension test required students to recognise significant ideas, arrange events in sequence, locate specific details and facts, give meanings of words in context, make judgements from given facts, draw conclusions, identify character attributes and determine the cause of events.

Reading material found in daily living was used in the reading for different purposes test; for example, a newspaper advertisement or a tourist guide. Students were required to locate information, follow directions, use reference skills and interpret information from a variety of sources. The stimulus material was presented in the form of a newspaper.

The results on individual items were grouped into three categories depending on the degree of difficulty: easy, moderately difficult and very difficult. Items answered correctly by less than 40% of students were classified as very difficult, by more than 70% of students as easy, and by 40% to 70% as moderately difficult.

The distribution of performance for various score ranges on both tests is included in this chapter.

A table of means and standard deviations for the subtests and the total test is provided.

The comprehension tests contained many more items than any comprehension tests administered prior to 1991. As the materials used in previous years were dropped, no comparison of performance can be made between that of 1991 and those of earlier years.

Year 7 Reading Tests Results

The 1991 results from urban schools showed that the majority of students had acquired the reading skills expected of Year 7 based on the NT curriculum. The thirty-nine-item comprehension test (UR7C91) had an overall mean of 26.95, while the thirty-five-item reading for different purposes test (UR7R91) had an overall mean of 28.81.

Item 19 was the only question in the reading for different purposes (RDP) test answered correctly by less than 50% of all students. The question required students to find the missing 'guide words' on a dictionary page. It is interesting to note that most Year 5 students also had difficulty in finding the missing 'guide words' on a dictionary page. Most students had little problem in locating information, following directions, using library reference skills or interpreting information from material presented.

The comprehension test comprised a narrative and two explanatory passages.

Passage one was an extract from a narrative text called 'Horned Helmet' in *Reading from the Bookshelf*. A high proportion of students showed evidence of ability in identifying character types and sensing emotional reactions (items 7, 8), making simple inferences (items 1, 10), determining meanings of words from contextual clues (items 2, 5 and 6), identifying emotional effects produced by a text (item 13), predicting an outcome and drawing a conclusion (item 3), recognising the author's point of view (item 12), drawing a conclusion based on evidence from the text (item 4), interpreting and understanding detail by 'reading' pictures and graphics (item 15) and determining the main idea of a text (item 9). Slightly more than half of all students were able to form sensory impressions from the language of the text (item 11) and identify implied meaning from the language (item 14), while marginally less than 50% of all students were capable of understanding the schematic structure of the narrative.

Passage two was an explanatory passage describing the greenhouse effect. Only a minority of students had difficulty with locating facts and details (items 17, 19, 20, 21 and 24), recognising cause–effect relationships (items 22, 27), drawing a conclusion based on evidence from the text (item 28), interpreting and understanding details by reading pictures/graphics (item 18) and recognising a sequence of occurrences (item 26). More than half of all students were able to find the relationship between two different diagrams (item 25) and recognise the function of the atmosphere from the text (item 23). All questions from this passage were answered correctly by more than 50% of all students.

Passage three explained how volcanoes are formed. Only a few students had difficulty with locating facts and details (items 29, 30, 31 and 33), understanding terminology (items 34, 36 and 39), recognising cause–effect relationships (items 32, 35) and interpreting and understanding details by 'reading' pictures and graphics (item 37). Item 38 was the only question where less than a quarter of all students had answered correctly. This question required students to extract information from a diagram showing an explosive volcano.

Percentage Correct on Items

Altogether, 1842 students took the comprehension test. As shown in Table 6.1, only one item was in the very difficult category compared to twenty items in the easy category and eighteen items in the moderately difficult category. Over 86% of students answered questions 8, 10, 17 and 30 correctly. Questions 38 and 16 were the only two items in which less than 50% of students responded

correctly. Question 38 was an open-ended question requiring students to locate specific details and facts. A sample of items is included in Appendix VII.

A total of 1845 students took the RDP test. It was noted that 82.85% (twenty-nine items) of questions fell in the easy category and none were found to be in the very difficult category. The most difficult question was number 19 with 48.02% of students answering correctly. Question 19 required students to know how to use 'guide words' in the dictionary. The easiest items were numbers 2 and 27 for which more than 95% of students responded correctly. A sample of items is included in Appendix VIII.

Table 6.1: Difficulty of Items: Reading Year 7

% Answered correctly	Difficulty	Comprehension UR7C91	Different Purposes UR7R91
70 – 100%	Easy	20	29
40 – 69%	Moderately difficult	18	6
< 40 %	Very difficult	1	0
Total		39	35

Distribution of Test Scores

There were 0.60% of students scoring 5 or less, while 9.39% of students scored in the topmost range of 36–39 in the comprehension test. About 80% of students attained more than 20 out of 39. The highest score was 39 (four students) and the lowest score was zero (three students).

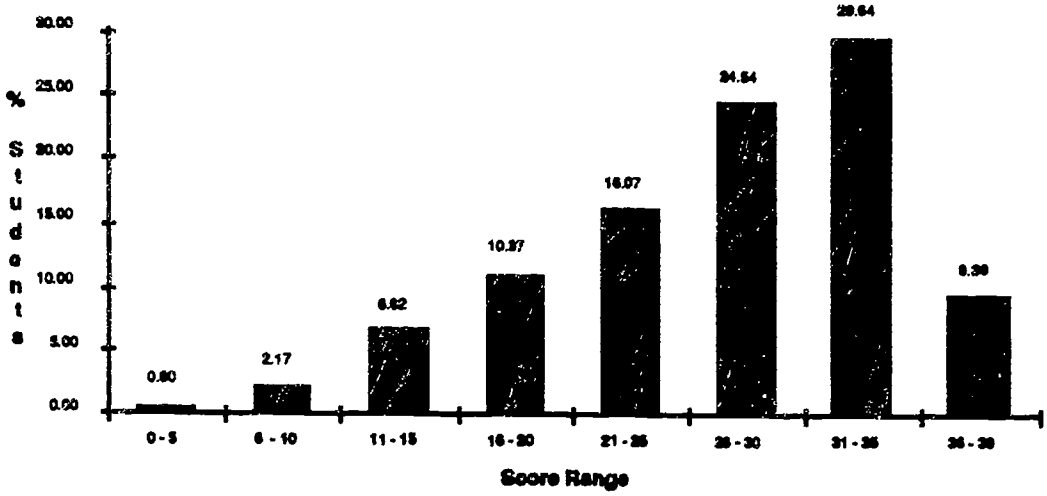
The RDP test comprised thirty-five items. Only 0.49% of students scored 5 or less, while 50.89% of students scored in the uppermost range of 31–35. Less than 10% of students scored lower than 21 out of 35. The highest score was 35 (114 students) and the lowest score was zero (three students).

Table 6.2: Distribution of Scores: Reading Year 7

COMPREHENSION (UR7C91)			DIFFERENT PURPOSES (UR7R91)		
Score Range	No. of Students	% of Students	Score Range	No. of Students	% of Students
0 – 5	11	0.60	0 – 5	9	0.49
6 – 10	40	2.17	6 – 10	33	1.79
11 – 15	122	6.62	11 – 15	44	2.38
16 – 20	202	10.97	16 – 20	82	4.44
21 – 25	296	16.07	21 – 25	203	11.00
26 – 30	452	24.54	26 – 30	535	29.00
31 – 35	546	29.64	31 – 35	939	50.89
36 – 39	173	9.39			
Total	1842	100.00	Total	1845	100.00

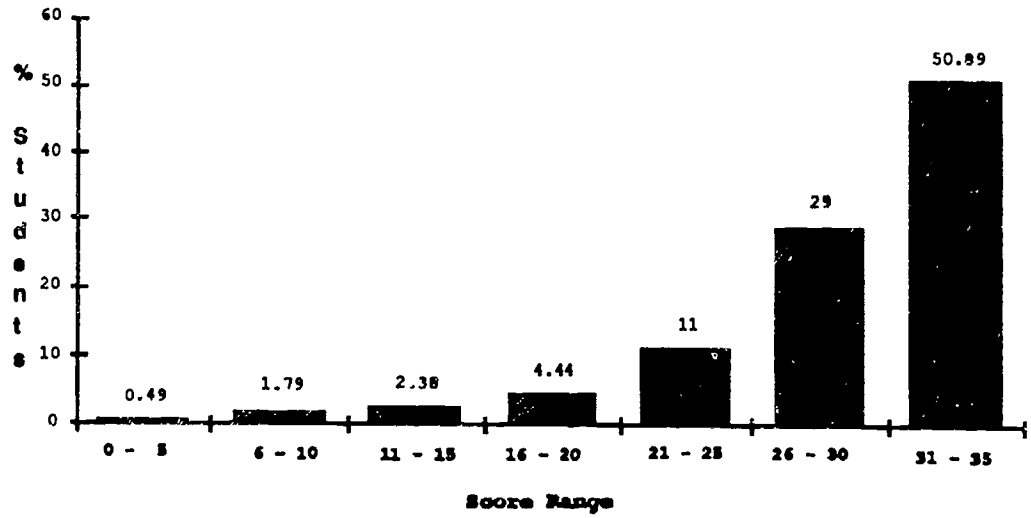
As shown in Graph 6.1, the distribution of the results was skewed towards the higher scores, suggesting clearly that students did reasonably well in the comprehension test.

Graph 6.1: Distribution of Scores: Comprehension Year 7



As shown in Graph 6.2, the distribution of the results for the RDP test is far from a bell shaped normal distribution. The results were very encouraging.

Graph 6.2: Distribution of Scores: RDP Year 7



Means for Reading Tests

The size of the standard deviations once again demonstrates that individual scores varied considerably for both the comprehension and the functional purposes (RDP) tests. The mean for the functional purposes test was notably higher than that for the comprehension test.

Table 6.3: Means on Reading Tests: Year 7

TEST CODE	No. of Items	MEANS	STD DEV	No. of students
UR7C91	39	26.95	7.45	1842
UR7R91	35	28.81	5.99	1845

As shown in Table 6.4, the means expressed as percentages for narrative (P1NAR), explanation 1 (P2EXP) and explanation 2 (P3EXP) were 70.75%, 71.66% and 63.9%, respectively. It appears that the subtest on passage 3, explanation 2, was marginally more difficult.

Table 6.4: Means on Subtest: Comprehension Year 7

TEST (UR7C91)	No. of Items	MEANS	STD DEV	No. of students
NARRATIVE (P1NAR)	16	11.32	3.17	1892
EXPLANATION 1 (P2EXP)	12	8.60	2.67	1892
EXPLANATION 2 (P3EXP)	11	7.03	2.65	1892
Total	39	26.95	7.45	1892

7 NON-URBAN SCHOOLS READING TESTS

Introduction

Two tests were set for non-urban schools; a comprehension test and a reading for different purposes test. As in urban schools, the tests included questions in both the multiple-choice and open-ended formats. Time allowed for the completion of the test was left to the discretion of the teacher. The testing program was to be completed over a fixed period of a few days.

The comprehension test contained sixty-five items and the reading for different purposes test consisted of fifty-three items.

The prose passages used in the comprehension test were selected from materials normally encountered in the classroom. The test required students to recognise significant ideas, arrange events in sequence, locate specific details and facts, give meaning to words in context, make judgements from given facts, draw conclusions, identify character attributes and determine the cause of events.

A selection of reading materials found in daily living was used in the reading for different purposes test, for example, a newspaper advertisement for a tourist destination. Students were required to locate information, follow directions, use library reference skills and interpret information from a variety of sources.

The comprehension test comprised three stages and each stage consisted of two subtests: Stage 3 included a letter (P1S3) and a simple narrative (P2S3), Stage 4 included a procedure (P3S4) and an explanation (P4S4) and Stage 5 included a report (P5S5) and a narrative (P6S5).

The results on individual items were grouped into three categories depending on the degree of difficulty: easy, moderately difficult and very difficult. Items answered correctly by less than 40% of students were classified as very difficult, by more than 70% of students as easy, and by 40% to 70% as moderately difficult.

The distribution of performance of students for various score ranges on both tests is included in this chapter.

A table of means and standard deviations for subtests and total test is provided.

Non-urban School Reading Tests Results

The results show that non-urban students found the reading comprehension (ABC91) and reading for different purposes (ABR91) tests difficult. The means for the sixty-five-item comprehension test and the fifty-three-item reading for different purposes (RDP) test were 24.82 and 26.09 respectively.

In the RDP test, slightly more than half of all students were able to locate details and facts from a page of contents (items 1 – 4). A similar proportion of students answered correctly questions relating to a map of the Northern Territory (items 5 – 9) except item 6 in which students were asked to name the ranges near Alice Springs. From the Blekbala Mujik band poster, around 60% of all students were correct on items associated with locating details (items 10, 12 and 13), but more than half of all students had problems in locating information, when the word 'first' or 'after' was included in the question (items 11, 14). From the food and drink poster, 65% – 70% of students were able to find out the cost of the goods (items 15, 18), which item to buy for washing (item 19) and the name of the shop from the poster (item 17), but less than half of all students were able to locate the information regarding the weight of coffee (item 16). Only about one-third of all students were successful on questions about the use of a telephone directory (items 20 – 24) which probably suggests that many were unfamiliar with the task. Around 50% of all students were able to locate information from the 'Frontier Camel Farm' advertisement (items 25 – 30), but only 22% were able to interpret the information provided (item 28). Slightly more than half of all students were capable of locating facts (items 31, 33 and 34), but less than half could determine the order of instructions (items 32, 35) from the 'A24 Lice Remover Shampoo' directions. From the 'Excursion Timetable', approximately 50% of all students were able to state the day a given activity was held or vice versa (items 36, 37, 38, 41 and 42), but most students failed to locate information given outside the table (item 40). Nearly 50% of all students were able to answer questions relating to the 'TV Guide' (items 43 – 47). Approximately half of all students were able to match the correct word to a picture (items 48 – 53).

The comprehension test comprised Stages 3, 4 and 5. Each stage had two passages. The first two, middle two and the last two passages belonged to Stages 3, 4 and 5 respectively. It should be noted that the higher the stage, the more difficult the items in the test.

Passage one (Stage 3) was a letter. More than half of all students were able to identify the purpose of the letter (item 8) and give the date on which the letter was written (item 7). Slightly less than half were able to identify the sender and receiver (items 1, 2), locate details from the contents (items 3, 5 and 6) and find out the cost of the stamps (item 5), but only a quarter of the students could interpret and predict the next event based on the contextual clues (item 9).

Passage two (Stage 3) was a simple narrative called 'The big old crocodile'. Most students had no difficulty in identifying the main character (item 10). Approximately 50% of all students were able to locate details and facts (items 11, 12, 13, 14, 16, 17, 18 and 19) and identify the main idea of the whole story (item 15).

Passage three (Stage 4) described a procedure in making a 'damper'. About 50% of students were able to locate details and facts (items 23, 21 and 26) and arrange the sequence of events (item 24), but only about 30% were able to make simple inferences (items 22, 25, 28 and 29).

Passage four (Stage 4) was an explanation called, 'Getting pandanus ready for use'. This passage consisted of eleven questions. Only one question (item 30) on locating facts from text was answered correctly by more than 50% of all students. The majority of students experienced difficulty in identifying the author (item 39), identifying the main idea in a paragraph and in the whole story (items 38, 40), and in locating facts and details (items 31, 32, 33, 34, 35, 36 and 37).

Passage five (Stage 5) was a report on lead poisoning, 'Magpie geese cause concern'. Approximately one third of all students were able to locate facts (items 41, 42, 44, 45, 46 and 48). About one quarter of students were able to identify the main idea of the report (item 50), interpret and make simple inferences (item 49) and locate details (items 43, 47). Only one-seventh of all students were able to identify the main idea of a paragraph (item 51).

Passage six (Stage 5) was a narrative about a snake, 'Perriwanteena'. All items had a success rate of well below 50%. About 30% to 40% of students could find facts and details (items 52, 54, 55, 56, 57, 59 and 60). Between 25% and 30% of students were able to make simple inferences (items 61, 63), identify main characters (item 65) and suggest a meaningful title (item 62). The tasks of arranging events in a sequence proved difficult for a large majority (item 64).

Percentage Correct on Items

A total of 1330 students took the reading comprehension test. The distribution of items was found to be as follows: easy, one item; moderately difficult, twenty-six items, and very difficult, thirty-eight items (Table 7.1). Students found questions 35, 51 and 64 difficult with less than 20% of all students responding correctly. Question 51 required students to recognise the main idea of a paragraph. Questions 10 and 17 were the only two questions in which more than 60% of all students answered correctly.

The number of students who sat for the RDP test was 1424. As shown in Table 7.1, no item fell in the easy category: there were forty-three items which were moderately difficult and ten items turned out to be very difficult. Most students had difficulty with questions 28 and 35; less than 30% of all students answered them correctly. Question 28 required students to locate information from an advertisement and apparently more logical thinking was needed in answering this question. The easy questions were numbers 10, 15 and 19, which were responded to correctly by more than 66% of all students.

Table 7.1: Difficulty of Items in Reading: Non-urban Schools

% Answered Correctly	Difficulty	Comprehension ABC91	Different Purposes ABR91
70 – 100%	Easy	1	0
40 – 69%	Moderately difficult	26	43
< 40 %	Very difficult	38	10
Total		65	53

Distribution of Test Scores

In the reading comprehension test which had sixty-five items, 31.73% of all students scored 10 or lower, while 2.33% of all students attained the uppermost score range of 61 – 65. The top score in this test was 65 (five students) and the bottom score was zero (136 students).

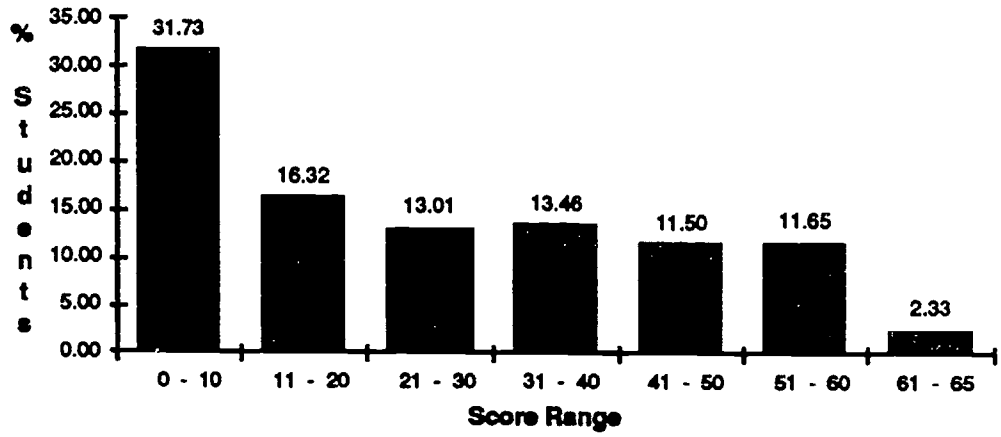
The RDP test comprised fifty-three items. Some 26.12% of students scored 10 or lower, whilst 4.42% of students scored in the uppermost range of 51 – 53. The maximum score of 53 was obtained by eleven students; however, sixty-five students scored zero.

Table 7.2: Distribution of Scores in Reading: Non–urban Schools

COMPREHENSION (ABC91)			DIFFERENT PURPOSES (ABR91)		
Score Range	No. of students	% of students	Score Range	No. of students	% of students
0 – 10	422	31.73	0 – 10	372	26.12
11 – 20	217	16.32	11 – 20	230	16.15
21 – 30	173	13.01	21 – 30	179	12.57
31 – 40	179	13.46	31 – 40	248	17.42
41 – 50	153	11.50	41 – 50	332	23.31
51 – 60	155	11.65	51 – 53	63	4.42
61 – 65	31	2.33			
Total	1330	100.00	Total	1424	100.00

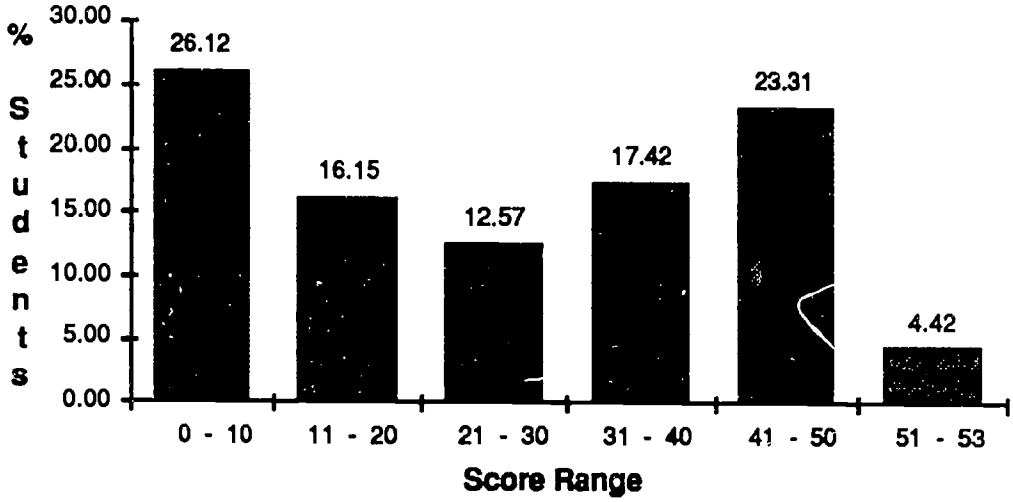
The graph in Graph 7.1 shows that the higher the score range, the smaller the proportion of students. Evidently, most students found the test difficult.

Graph 7.1: Distribution of Scores in Comprehension: Non–urban Schools



The distribution of scores depicted in Graph 7.2 shows two peaks: about 26% of students were in the 0 – 10 range and 23% in the upper range of 41 – 50. There appear to be two distributions and one could only conjecture as to the reasons for this. There is evidence to suggest that there was a substantial proportion of reasonably good performers but also a large number of very low achievers.

Graph 7.2: Distribution of Scores in RDP: Non–urban Schools



Means for Reading Tests

The mean score for the comprehension test was lower than that for the RDP test. The size of the standard deviations demonstrates again that individual scores varied greatly for both tests.

Table 7.3: Means on English Tests: Non–urban Schools

TESTCODE	No. of Items	MEANS	STD DEV	No. of students
ABC91	65	24.82	19.51	1330
ABR91	53	26.09	16.74	1424

Table 7.4 shows that the means were quite evenly distributed among the subtests. They appear to be low in all subtests. As expected, students performed better on the subtests at the lower stages. The size of the standard deviations indicates that individual scores varied a great deal.

Table 7.4: Means on Subtests in Comprehension: Non–urban Schools

TEST (ABC91)	No. of Items	MEANS	STD DEV	No. of students
Letter (P1S3)	9	4.08	2.99	1330
S.Narrative (P2S3)	11	5.95	4.29	1330
Procedure (P3S4)	9	3.66	3.16	1330
Explanation (P4S4)	11	3.63	3.44	1330
Report (P5S5)	11	3.13	3.41	1330
Narrative (P6S5)	14	4.36	4.83	1330
Total	65	24.82	19.51	1330

8 SUMMARY AND CONCLUSION

In November of 1991, nearly 4000 students in Years 5 and 7 from all urban schools throughout the Northern Territory participated in the Primary Assessment Program (PAP). Another 1700 students aged ten and older from non–urban schools participated in a similar PAP testing program. There were approximately 3500 students in the ten years and older cohort including about 400 students from the homeland centres. The PAP is conducted annually as a monitoring device for standards across the Territory and a means of reporting to schools what their own students can or cannot do in English and mathematics.

In some aspects, the PAP is different from other programs of its kind in Australia. Since its introduction in 1983 in urban schools, the confidentiality arrangements negotiated between schools and the system have worked remarkably well.

It may be argued that one of the reasons why the PAP has won wide acceptance among principals and teachers is because the results have been handled responsibly and with care, due to their sensitivity. A recent observation is well worth mentioning. In March this year, at an inservice held in Alice Springs for teachers and assistant principals from urban schools, participants engaged in frank and open discussion about school results and exchanged information. There was a willingness to share data amongst schools. The exercise was perceived as useful and is likely to occur more and more at inservices in the future so long as it is seen as mutually beneficial.

The last two years have seen important developments in the areas of test construction and reporting of results. In reading, the tests have been expanded and modified so that they are consistent with the learning outcomes in the new English curriculum. In reading for different purposes, a wider range of everyday materials has been included to test literal comprehension, and in reading comprehension, students are exposed to texts from at least two genres and engaged at a deeper level of understanding than previously.

In mathematics, there has been an increasing tendency to include more questions involving higher order thinking processes. In the four categories of skills tested—recall, computation, understanding and application—the majority of questions were in the understanding and application categories. An overwhelming number of items appeared in the open-ended format even though many multiple-choice questions were included to test higher order processes.

A summary of the results in the mathematics tests for urban schools follows. The sixty-item mathematics test for Year 5 covered an extensive range of tasks in number, measurement and space. With a mean score of 35 obtained, performance was generally considered to be satisfactory. The majority of students were successful in interpreting graphs, adding and subtracting integers and recognising even numbers. However, students did not perform as well in word problems; and they were less successful in dealing with place values and equivalence of fractions. In the space strand, most students were able to recognise shapes and lines of symmetry and succeeded in translating and rotating shapes but many had difficulty in handling coordinates in the

Cartesian plane. It was in the measurement strand that students had least success. Although many did not have a problem with tasks involving metric units of mass, length or volume, a high proportion found calculation of time intervals, surface area, and perimeter especially difficult.

A mean of 33 obtained for the sixty-item test in Year 7 is comparable to that for Year 5. In the number strand, the majority could operate with integers, decimals, fractions and word problems. They were less successful in simplifying improper fractions, order of operations and approximation. In the space strand, most were able to identify types of triangles and calculate angles but quite a high proportion failed to recognise congruent triangles, translate and rotate shapes or find the number of faces, edges and vertices of a prism. In the measurement strand, most were successful in finding mass, perimeter and distance on a map. Items in the vicinity of 50% correct were in calculation of volume, time intervals, circumference, area of triangles, interpreting a flight schedule and converting metres to centimetres. About a third of the students were able to find the area and perimeter of a composite shape.

An analysis of performance in mathematics was carried out to determine if there were any significant changes between the results in 1990 and those in 1991 for Years 5 and 7 respectively. A test of significance between means for correlated data showed a significant improvement in performance in 1991 at each year level. This was indeed very encouraging.

Whereas for urban schools, the mathematics test covered one stage at each year level, i.e. Stage 5 for Year 5 and Stage 7 for Year 7, the test for non-urban schools encompassed two stages, Stages 3 and 4 of the mathematics curriculum. In the number strand, most were able to add without regrouping, solve word problems, read a bar graph and shade a given fraction. They could select the smallest integer, read a table and identify place values. However, the majority could not perform arithmetical operations involving regrouping. Tasks in the measurement strand proved difficult for most. Although a considerable number could read a digital and a twelve-hour clock, measure a straight line and identify the shape with the longest perimeter, most were unable to read a calendar, identify the largest area, calculate how many lots of five minutes in half an hour or how many 100 gram chocolate bars in 1 kilogram. In the space strand, many were able to rotate an object, locate objects in a grid or complete a pattern of shapes but only a minority could identify three-dimensional shapes, find volume by counting cubes or recognise a symmetrical shape.

The mathematics test for non-urban schools had changed considerably both in structure and content in 1991; hence it was not possible to compare the results between 1990 and 1991.

The results from the Year 5 reading tests in urban schools were pleasing; the mean for the thirty-three-item reading for different purposes (RDP) test was 24 and the mean for the forty-item comprehension test was 27.

The stimulus materials for the RDP test were presented in the form of a newspaper. Most students had no trouble in responding to tasks based on various kinds of environmental print such as the Territory Wildlife Park pamphlet, a microwave hamburgers recipe, Darwin cinema guide, Darwin Crocodile Farm pamphlet and Today's Television Guide.

The comprehension test included three passages from the report, explanation and narrative genres. Analysis of the results gave mean scores of 76%, 60% and 63% respectively. Passage one was an article on the Australian wild dog, the dingo. Most students were able to locate details and facts, identify the main idea of a paragraph, give meanings of words and recognise the writer's purpose. Of two tasks which required students to infer from the text, one was answered correctly by 74% but the other had a success rate of only 43%.

Passage two was an extract explaining how human beings breathe. The majority could locate facts and details, identify the main idea of the text and give meanings of words. But less than 50% could compare between two structures.

Passage three was the well-known story about a shepherd boy who cried, 'Wolf'. Most students succeeded in locating facts and details, identifying the main ideas, inferring and drawing conclusions and giving meanings of words.

Results from the Year 7 reading tests in urban schools gave a mean of 27 on the thirty-nine-item comprehension test and a mean of 29 on the thirty-five-item reading for different purposes (RDP) test. These were very satisfactory results.

In the RDP test which simulated a newspaper, a variety of everyday materials was presented including information about Ross River Fever, Museums of the Northern Territory, Yulara Tourist Resort, a cake recipe, a product label from a chemist, and a page from a telephone directory and a dictionary. The majority succeeded in locating or interpreting information, following directions and using library reference skills.

The reading comprehension test included a narrative and two explanatory texts. Average scores obtained were 71%, 72% and 64% respectively. The results were very satisfactory.

Passage one was a narrative. The majority showed that they were able to identify the characters, make simple inferences, give meanings of words, predict an outcome, recognise the author's point of view and identify main ideas.

Passage two was an explanatory text which described the greenhouse effect. Most succeeded in locating facts and details, recognising cause and effect, drawing a conclusion and stating a sequence of occurrences.

Passage three explained how volcanoes were formed. Most students could locate facts and details, interpret terminology used, identify cause and effect relationships and interpret information from pictures and graphics.

In non-urban schools, the results in the reading tests indicated that the students found them to be quite hard. Means for the RDP test (fifty-three items) and comprehension test (sixty-five items) were 26 and 25 respectively.

In the RDP test, a little more than 50% were able to locate facts and details from a page of contents, a simple map of the Northern Territory and a poster about a music band. Students were more successful in locating information

from a food and drink poster, but less successful in using a telephone directory. In the advertisement for the Frontier Camel Farm, about 50% could locate the information required but a much lower proportion could interpret the facts. In most of the other tasks, the success rates were about 30–60%.

The comprehension test for non-urban schools contained passages at three levels of difficulty: Stages 3, 4 and 5 of the curriculum. An analysis was carried out for each of the stages.

At Stage 3, the text was a short, simple letter. More than 50% could identify the purpose of the letter and give the date on which it was written. Slightly less than 50% were able to identify the sender and receiver, locate details and find the cost of the stamps but only a quarter could interpret and predict the next event. Also, for this stage, a simple narrative called 'The big old crocodile' was given. The majority had no trouble in identifying the main character and about half were able to locate facts and details and identify the main idea of the story.

The two passages at Stage 4 consisted of a procedural and an explanatory text. In the first, about making a damper, many had difficulty in sequencing events and making inferences. In the second, the majority were unable to identify the author, select the main idea and locate facts and details.

At Stage 5, the first text was a report on lead poisoning, 'Magpie geese cause concern'. About one-third could locate facts, a quarter were able to identify the main idea of the report, infer and locate details. The second passage was a narrative about a snake. The success rate was well below 50% for all items. Between 30% and 40% could locate facts, and about 30% were able to identify the main characters and suggest a meaningful title. Putting events in a sequence proved difficult for a large majority.

Significant changes to the reading tests were necessitated in 1991 to bring them in line with the new English curriculum. As a consequence of this, no comparison was possible between performance in 1990 and 1991. The tests designed for 1992 will provide a basis for comparing 1992 results with those obtained in 1991.

For the reader with an interest in measurement statistics, some information about the characteristics of the tests used in the PAP in 1991 is given in Appendix XI. The test writers will have reason to feel pleased with the reliabilities obtained for all the tests in 1991 which were in the region of 0.9 or a little higher. It should be mentioned that due to the large variation in scores coming from a very heterogeneous cohort aged ten and older in non-urban schools, the reliabilities obtained for the non-urban tests were marginally inflated.

APPENDIX I: 1991 COMMITTEES FOR THE PRIMARY ASSESSMENT PROGRAM

NT BOARD OF STUDIES - Primary Assessment Committee

Mr Cliff Fowler	*(Chair) Chief Assessor- ERA*
Mr Ron Abbott	*Principal - Millner Primary School*
Mr Nick Cockshutt	*Director - Curriculum*
Mr Huang Zheng Sen	*Principal Research Officer - ERA*
Mr Mick Myers	*Principal - Moil Primary School*
Ms Sue Murphy	*(Executive Officer) SEO - ERA*
Ms Robyn Ferguson	*Shepherdson College*
Ms Judy Payne	*Ludmilla Primary School*
Ms Pascale Dixon	*(Executive Officer from 1 Jan 1992) SEO-ERA*

TEST CONSTRUCTION PANELS

Urban Schools Year 5 Mathematics Test Panel

Ms Sue Murphy (Convenor)	*Curriculum & Assessment*
Ms Pascale Dixon	*Curriculum and Assessment*
Ms Robyn Blake	*Wanguri Primary School*
Ms Colleen Williams	*Sanderson Primary School*
Mr David Henry	*Nakara Primary School*
Mr Neil Williams	*Howard Springs Primary School*
Ms Liz Gammon	*Jingili Primary School*
Mr John Moulds	*Ludmilla Primary School*
Ms Pam Adams	*Ludmilla Primary School*
Ms Anne Mauger	*Moil Primary School*

Urban Schools Year 7 Mathematics Test Panel

Mr Albert Loh (Convenor)	*Curriculum & Assessment*
Mr Alan Sargent	*Wanguri Primary School*
Ms June Wessels	*Sanderson Primary School*
Mr Lovell De'Souza	*Nakara Primary School*
Mr Bill Armstrong	*Ludmilla Primary School*
Ms Josie Roberts	*Moil Primary School*
Mr Geoff Gillman	*Holy Spirit Primary School*
Mr Gerry McCormack	*St John's College*
Mr Peter McPhee	*Wagaman Primary School*
Ms Sue Rae	*Parap Primary School*
Mr Bill Shorter	*Darwin High School*

Non-urban Schools Mathematics Test Panel

Ms Sue Murphy (Convenor)	*Curriculum & Assessment*
Ms Pascale Dixon	*Curriculum & Assessment*
Mr Barry Kepert	*Schools North Branch*
Ms Jan Perrin	*Schools North Branch*
Mr Paul Bubb	*Curriculum & Assessment*
Ms Diana Michalek	*Belyuen School*
Ms Nellie Mok	*AEP DEB*
Mr Peter Ailery	*AEP DEB*
Mr Bill Turner	*Moil Primary School*

Urban Schools Yr 5 and Yr 7 Reading for Different Purposes Tests Panel

Ms Jeannie Abbott (Convenor)	*Curriculum & Assessment*
Ms Debbie Ford	*Sanderson Primary School*
Ms Julie Willis	*Sanderson Primary School*
Ms Denise Cole	*Parap Primary School*
Ms Georgie Barker	*Millner Primary School*
Ms Vivienne Hayward	*Curriculum & Assessment*
Mr Rick Collester	*Howard Springs Primary School*
Mr Chris Pownall	*Jingili Primary School*
Ms Anne Scott	*Ludmilla Primary School*
Ms Karen Taylor	*Ludmilla Primary School*

Urban Schools Yr 5 and Yr 7 Reading Comprehension Tests Panel

These tests were constructed by **Ms Jeannie Abbott** and **Ms Pascale Dixon** with assistance from specialists within the Department.

Non-urban Schools Reading for Different Purposes Test Panel

Ms Pascale Dixon (Convenor)	*Curriculum & Assessment*
Ms Karen McCarthy	*Rapid Creek Primary School*
Mr Sean Ryan	*Gray Primary School*
Mr Barry Kepert	*Schools North Branch*
Ms Margaret Osborne	*Schools North Branch*
Ms Pam Norman	*Operations North*

Non-urban Schools Reading Comprehension Test Panel

Ms Pascale Dixon (Convenor)	*Curriculum and Assessment*

This test was constructed at regional inservices during the year. The primary purpose of the regional inservices was to explain the Primary Assessment Program (PAP) to schools within the region.

URBAN SCHOOLS WRITING MODERATION PANEL

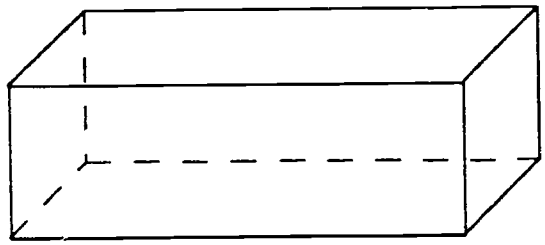
Ms Jeannie Abbott (Convenor)	*Curriculum & Assessment*
Ms Debbie Ford	*Sanderson Primary School*
Ms Chris Khan	*Malak Primary School*
Mr Geoffrey Naider	*Leanyer Primary School*
Ms Jackie Thompson	*St Paul's Primary School*
Ms Rita McGregor	*Wanguri Primary School*
Ms Freda Spann	*Wanguri Primary School*
Ms Vivienne Jennings	*Moulden Park Primary School*
Ms Vivienne Hayward	*Curriculum & Assessment*
Ms Lisa Bacskai	*Jingili Primary School*

NON-URBAN SCHOOLS WRITING MODERATION PANEL

Ms Pascale Dixon (Convenor)	*Curriculum & Assessment*
Ms Sandy Tyndall	*Alice Springs Regional Office*
Ms Veronica Lintern	*Barkly Regional Office*
Ms Kaye Byrne	*Shepherdson College*
Ms Elaine Lawurrpa	*Shepherdson College*
Ms Maree Mathews	*Maningrida School*
Ms Rebecca Baker	*Maningrida School*
Ms Nicole Purcell	*Elliott School*
Ms Mona Rennie	*Elliott School*
Ms Terry Davidson	*Lajamanu School*
Ms Belinda Baker	*Lajamanu School*
Ms Cecil Nielson	*PEO TESL*
Ms Sue Murphy	*Curriculum & Assessment*

APPENDIX II: YEAR 5 MATHEMATICS SAMPLE QUESTIONS

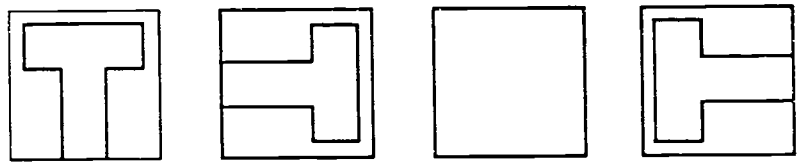
1. How many edges does a rectangular prism have?



Answer : _____

Strand: Space **% Correct = 48.0%**

12. Complete the pattern by filling the blank square.



Strand: Space **% Correct = 70.5%**

16. $1 - \square = \frac{3}{8}$

Strand: Number **% Correct = 30.4%**

17. 4 people share the cost of a $15.00 pizza equally. How much do they pay each for their share?

Answer : $_____

Strand: Number **% Correct = 30.7%**

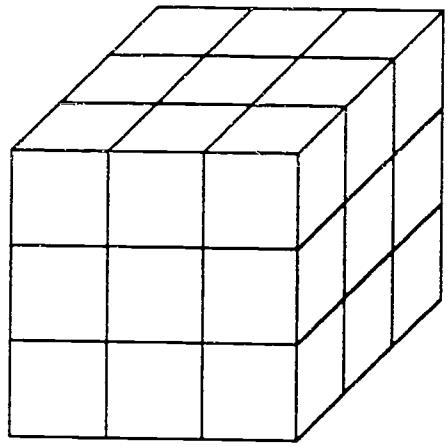
22.

$$6\overline{)612}$$

Answer : _____

Strand: Number **% Correct = 46.6%**

27.



What is the surface area of the cube?

Answer : _____squares

Strand: Measurement **% Correct = 29.3%**

32.

$$\frac{3}{10} + \frac{6}{10} = \square$$

Strand: Number **% Correct = 81.6%**

34. There are several stops on the journey between Darwin and Alice Springs.

BUS TIMETABLE

DARWIN to ALICE SPRINGS		
Departs Daily	Time	Service 15 B
Dep.	1100	**DARWIN** 69 Mitchell St
Arr.	1430	**Katherine** Roadhouse
Dep.	1500	**Katherine** Roadhouse
Arr.	2030	**Elliott** Roadhouse
Dep.	2100	**Elliott** Roadhouse
Arr.	0610	**ALICE SPRINGS** Plaza Hartley St

For how long did the bus stop altogether?

Answer : _____

Strand: Measurement **% Correct = 19.8%**

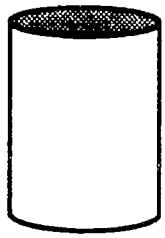
36. Which is the longest distance?

A. 1 km B. 2 km

C. 1 300 metres D. 1 400 metres

Strand: Measurement **% Correct = 77.3%**

43.



1 L (1000mL)

TIN

250mL

CUP

How many cups of water will I need to fill the tin?

Answer : _____ cups

Strand: Measurement **% Correct = 69.7%**

APPENDIX III: YEAR 7 MATHEMATICS SAMPLE QUESTIONS

3. Kim walked 500 m north, 400 m east and then 300 m south. How far has Kim walked?

Answer: _____ m

Strand: Number **% Correct = 90.5**

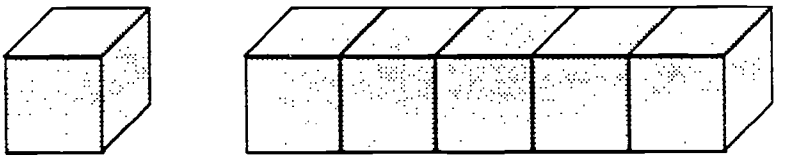
7. $\frac{3}{5}$ is equivalent to

A. $\frac{3}{15}$ B. $\frac{3}{8}$

C. $\frac{8}{20}$ D. $\frac{9}{15}$

Strand: Number **% Correct = 75.5%**

12. The mass of the small cube is 50 g. Find the mass of the rod.



50 g

Answer: _____ g

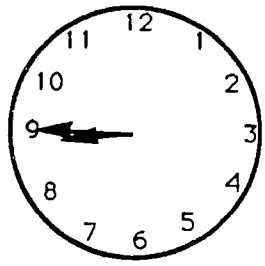
Strand: Measurement **% Correct = 87.3%**

21. Simplify $4\frac{3}{5} + \frac{3}{5}$

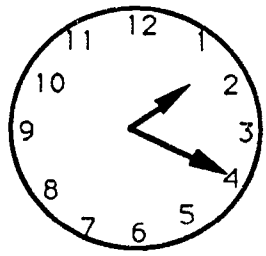
Answer: _____

Strand: Number **% Correct = 49.7%**

27. A man starts work in the morning at



and has lunch at

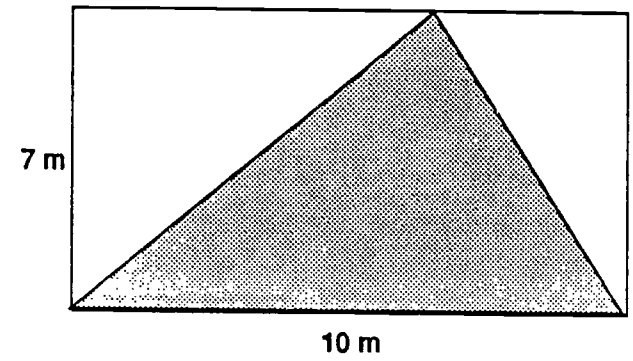


How long is it from when he starts work to when he has his lunch?

Answer : _____ h _____ min

Strand: Measurement **% Correct = 45.6%**

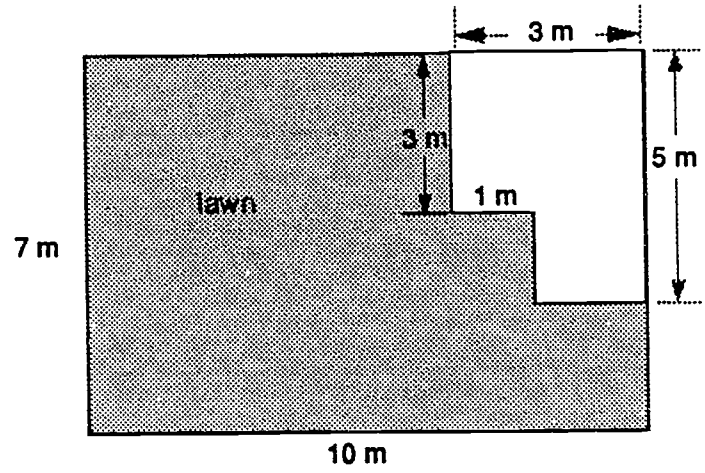
30. Find the area of the shaded triangle.



Answer: _____ m^2

Strand: Measurement **% Correct = 45.2%**

46. Find the area of the lawn.



Answer: _____ m^2

Strand: Measurement **% Correct = 28.3%**

50. The distance between Tennant Creek and Alice Springs is about 500 km by road. On a map with a scale of 1 cm representing 200 km, the distance between these two towns is

Answer: _____ cm

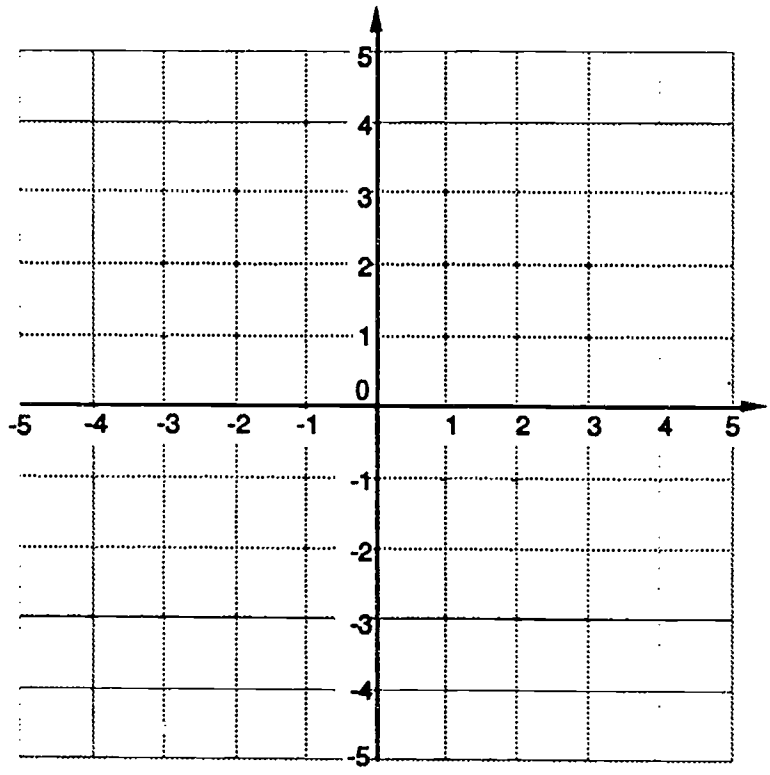
Strand: Space **% Correct = 71.2%**

54. A Year 7 student ran 8 laps of the oval at an average time of 1 minute 30 seconds per lap. If the student started at 8.21 am, what time did the student finish?

Answer: _____ am

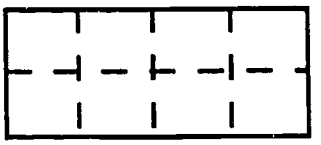
Strand: Space **% Correct = 35.8%**

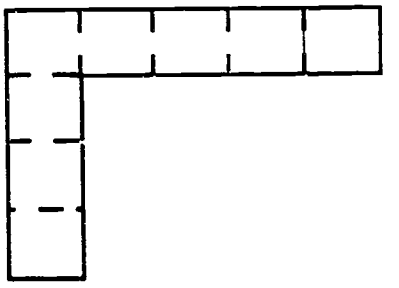
57. Plot the following co-ordinates (4, 5), (0, 1), (-5, -2) and (-3, 5).

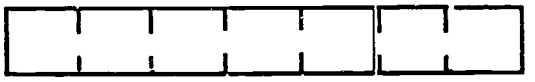


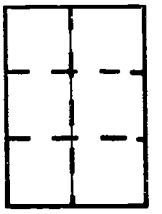
Strand: Space **% Correct = 28.7%**

3. Circle the shape with the longest perimeter.

A. 

B. 

C. 

D. 

Strand: Measurement(Stage 4) **%Correct = 55.8%**

8. If you bought boots which cost $32 and shorts which cost $12, how much would you spend?

Answer:$_____

Strand: Number(Stage 4) **%Correct = 54.3%**

17. One kilogram equals ☐ grams.

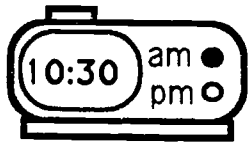
Strand: Measurement(Stage 4) **%Correct = 11.0%**

22. Shade the squares which show multiples of 7.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40

Strand: Number(Stage 4) **%Correct = 26.6%**

26. The time shown on the clock is:



A. one thirty

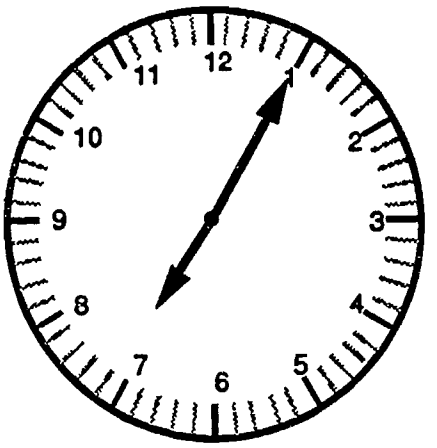
B. ten thirty

C. ten o'clock

D. quarter past ten

Strand: Measurement(Stage 3) **%Correct = 67.4%**

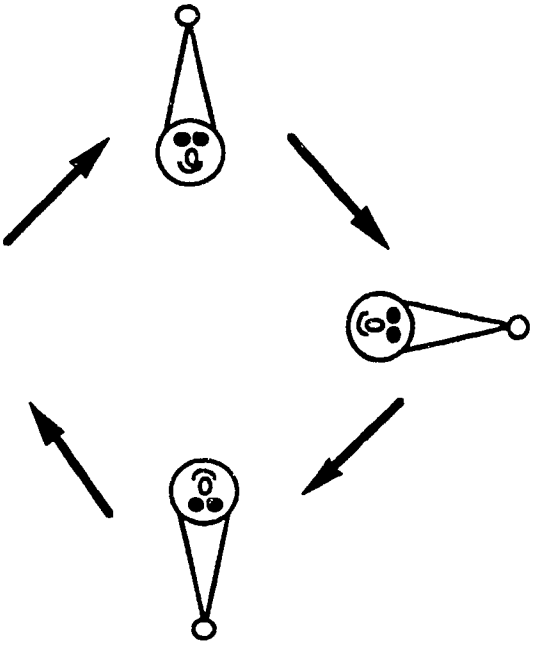
30. How many lots of five minutes in half an hour?



Answer: _____

Strand: Measurement(Stage 3) **%Correct = 19.0%**

34. Complete the pattern and draw the missing clown's head.



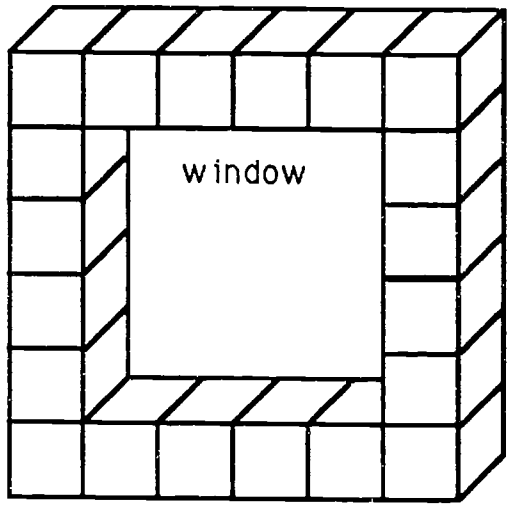
Strand: Space(Stage 3) **%Correct = 80.8%**

37.

$$\begin{array}{r} 23 \\ 476 \\ +\ 13 \\ \hline \\ \hline \end{array}$$

Strand: Number(Stage 4) **%Correct = 33.1%**

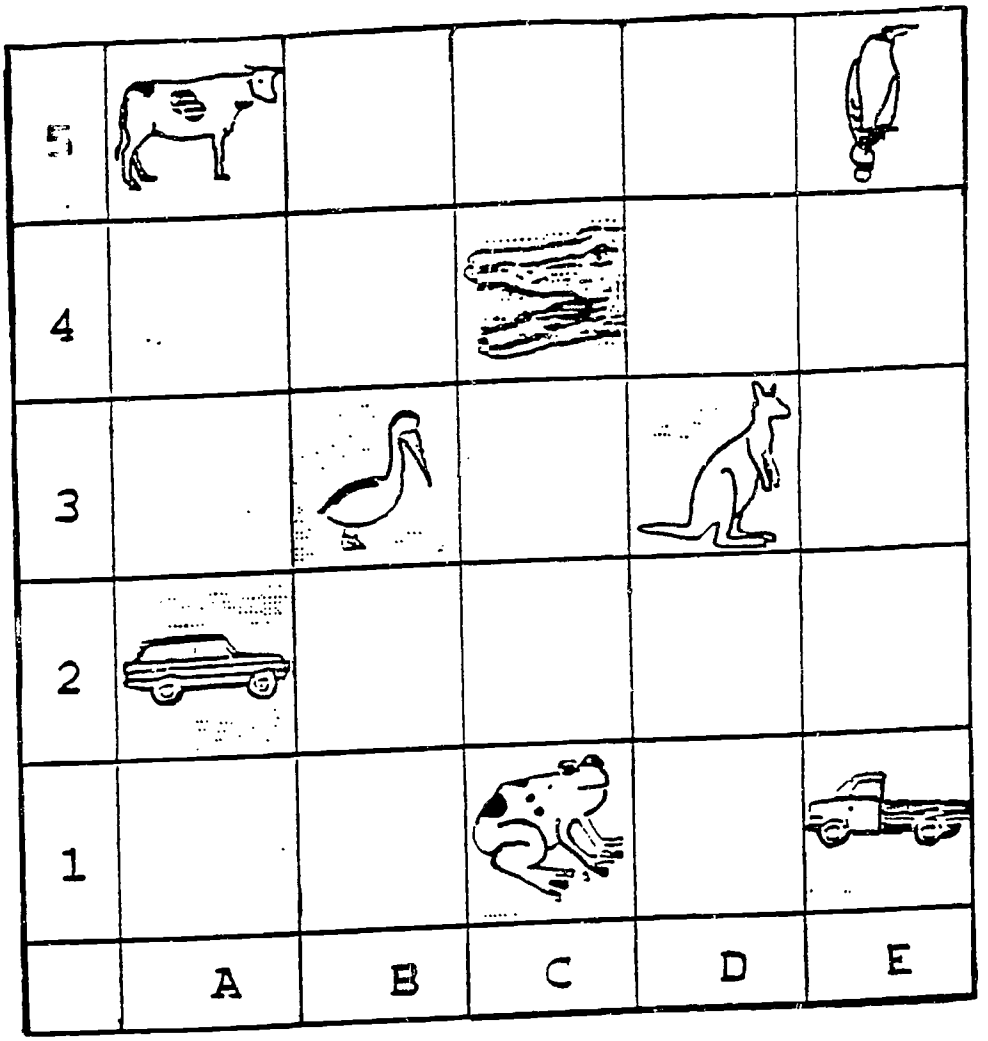
38. How many small cubes will fit inside this window?



Answer: _____

Strand: Space(Stage 4) **%Correct = 20.7%**

53. The Bullock is at A5. Where is the Crocodile?



(S4:P1:1 A3m)

Answer:_____

Strand: Space(Stage 4) **%Correct = 55.3%**

APPENDIX V: YEAR 5 READING COMPREHENSION SAMPLE QUESTIONS

THE BOY WHO CRIED 'WOLF'

1. Once there was a shepherd boy who had to go every day to a lonely pasture to tend his father's sheep. The pasture was at the foot of a mountain near a dark forest, and the boy found the days long and dreary. He longed for companions to help pass the lonely hours.

2. One day the shepherd boy had an idea about how he might amuse himself. Rushing down towards the village, he cried out, 'Wolf! Wolf!'

3. The villagers, thinking that the sheep were being attacked, grabbed up their clubs and pitchforks and hurried to the pasture to help the boy beat off the wolf. But there was no wolf there, and the villagers returned home.

4. This diversion so pleased the shepherd boy that he decided to repeat his performance. Twice more he rushed from the pasture crying 'Wolf! Wolf!' and twice more the villagers came to his aid.

5. Then one day a real wolf did attack the sheep, and the frightened shepherd boy raced to the village calling 'Wolf! Wolf!'. But the villagers went on with their work, paying no attention to him, and the wolf devoured many of his sheep. Too late, the shepherd boy learned that - liars are not believed even when they tell the truth.

This fable is believed to have been written by Aesop, a slave who lived in Greece many hundreds of years ago.

28. How often did the boy tend his father's sheep?

A. Once a week
B. Every day
C. When his father asked him
D. When the villagers were busy

PER CENT CORRECT = 88.05%

29. The boy did not enjoy his day because

A. it was long and dreary.
B. he was frightened of the wolf.
C. the villagers ignored him.
D. he did not like sheep.

PER CENT CORRECT = 77.64%

30. Why did the boy cry 'Wolf! Wolf!' the first time?

A. He wanted to amuse himself.
B. He saw a wolf.
C. The sheep were being attacked.
D. It had been a long day.

PER CENT CORRECT = 85.47%

32. In paragraph 4, the word **diversion** means

A. effort.
B. cry.
C. turn.
D. amusement.

PER CENT CORRECT = 61.68%

33. Why did the villagers pay no attention to the boy when he **really** cried for help?

Ans. _____

PER CENT CORRECT = 76.22%

35. Choose the most suitable title for paragraph 5.

A. Real Wolf Attacks
B. Villagers To The Rescue
C. Shepherd Boy Runs
D. Villagers Attack Wolf

PER CENT CORRECT = 78.70%

36. The **moral** of this story is that

A. sheep must be well protected against wolves.
B. shepherd boys have important jobs.
C. liars are not believed even when they tell the truth.
D. village people are hard workers.

PER CENT CORRECT = 76.48%

37. How do you think the boy felt when there was a real wolf but no one believed him?

A. He did not care.
B. He was frustrated.
C. He was sad.
D. He felt unlucky.

PER CENT CORRECT = 37.42%

38. This story is set **mainly**

A. at the foot of a mountain.
B. in a dark forest.
C. at the top of a mountain.
D. inside a village.

PER CENT CORRECT = 51.06%

39. Next time the shepherd boy will **not**

A. look after the sheep.
B. feel sad and lonely.
C. help the villagers.
D. cry for help unnecessarily.

PER CENT CORRECT = 78.17%

APPENDIX VI: YEAR 5 READING FOR DIFFERENT PURPOSES SAMPLE QUESTIONS

TERRITORY WILDLIFE PARK ADVERTISEMENT

GO WILD ON AUSTRALIA DAY!

You are invited to celebrate Australia Day with some of its most unique, furry, feathered and fishy citizens who inhabit the Territory Wildlife Park.

During your visit you can enjoy Aussie meat pies and lamingtons at the kiosk.

The park is open daily from 9.00 a.m. to 4.00 p.m.

Telephone 88 6000 for further information.

Territory Wildlife Park

1. The park is open from 9 am - 4 pm

   A. at weekends.
   B. on weekdays.
   C. every day.
   D. on school holidays.

PER CENT CORRECT = 87.96%

2. How many groups of wildlife inhabit the Park?

   A. Two
   B. Three
   C. Four
   D. Six

PER CENT CORRECT = 62.07%

3. What special Australian foods can you buy at the kiosk?

   Ans. _____

   Ans. _____

PER CENT CORRECT = 83.80%

4. Who are the 'citizens' in the wildlife park?

   A. Northern Territory people
   B. Park rangers
   C. Tourists from other places
   D. Birds, animals and reptiles

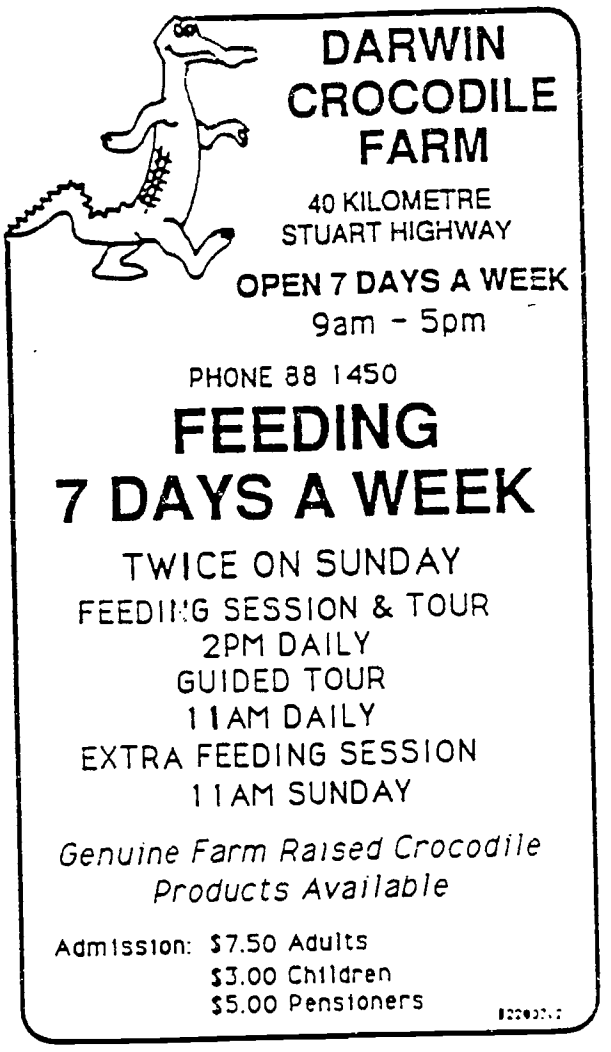
PER CENT CORRECT = 73.63%

5. Which special day is mentioned in this advertisement?

   Ans. _____

PER CENT CORRECT = 74.11%

CROCODILE FARM ADVERTISEMENT



7. If you visited the crocodile farm on a Sunday, you could see the crocodiles being fed

   A. once.
   B. twice.
   C. three times.
   D. seven times.

PER CENT CORRECT = 87.85%

18. The farm is open between

A. 9 am - 2 pm.
B. 11 am - 2 pm.
C. 9 am - 5 pm.
D. 5 am - 9 am.

PER CENT CORRECT = 83.27%

19. Feeding time at the Crocodile Farm is at

A. 2 pm daily.
B. 5 pm daily.
C. 9 am daily.
D. 11 am daily.

PER CENT CORRECT = 79.49%

20. What do you understand by 'genuine farm raised crocodile products'?

A. Things made from crocodiles bred in the rivers.
B. Things made from crocodiles bred at the farm.
C. Copies of crocodile products.
D. Toy baby crocodiles.

PER CENT CORRECT = 58.34%

APPENDIX VII: YEAR 7 READING COMPREHENSION SAMPLE QUESTIONS

PASSAGE THREE

HOW ARE VOLCANOES FORMED ?

In May 1990, a huge volcanic eruption blew away the top 400 metres of Mount St Helens in the United States. Dust, ash and gas rose high in the sky, and towns up to 500 kilometres downwind were covered in gritty volcanic ash. A large crater was left in the top of the mountain.

The rock in the Earth's mantle is like a thick paste, or the inside of a partly cooked cake. It is very hot, and in parts it is molten. This thick, hot, molten rock is called **magma**. It also contains dissolved gases. The enormous pressure from the surrounding rocks keeps the magma fairly solid. Sometimes this pressure forces the magma through a weaker part of the Earth's crust. When this happens, a volcano forms.

One way of understanding how magma is squeezed out at the surface of the Earth, is to think of what happens when a can of soft drink is shaken. Pressure builds up as long as a thumb is held over the opening, but if the thumb is lifted, the pressure is released. This causes an eruption.

When the magma reaches the surface, it erupts from a vent . Sometimes it oozes out steadily. Other times it blasts out with incredible force, as it did at Mount St Helens.

After a volcano has erupted and the pressure has been released, the magma may harden to form a plug which blocks the vent. When this happens, the eruption stops, and it is said that the volcano is **dormant**, or sleeping. Mount St Helens is one of these. If it does not erupt again, it is said that it is **extinct** or dead. On the other hand, if the pressure underneath the volcano builds up, it may become active again.

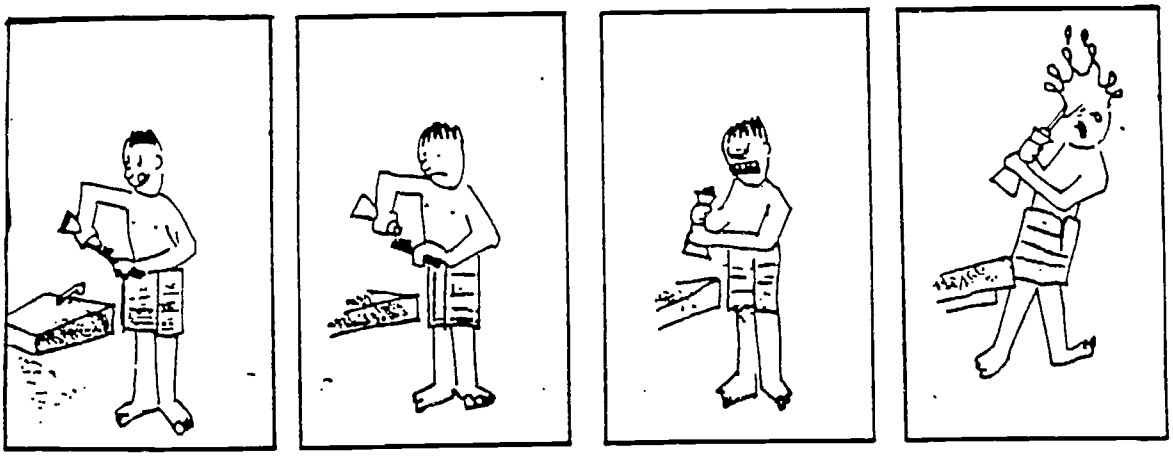


Figure 1 When a tube of toothpaste has not been used for a while, a hard lump forms in the mouth of the tube. The tube has to be squeezed very hard until the pressure forces it out. This is similar to a dormant volcano.

PLEASE TURN OVER

What happens when volcanoes erupt ?

When magma reaches the Earth's surface it is called **lava**. It is usually about 1000∞C, and is red-hot. As it cools, the lava turns to solid rock. This may take weeks, or it may happen very quickly if the lava flows into water.

Some volcanoes erupt violently, throwing dust, ash, rock, steam and other gases high into the air. Lava is usually produced from time to time as well. A steep-sided volcanic cone is built up, with a crater at the top (Figure 2). Mount St Helens is this type of volcano.

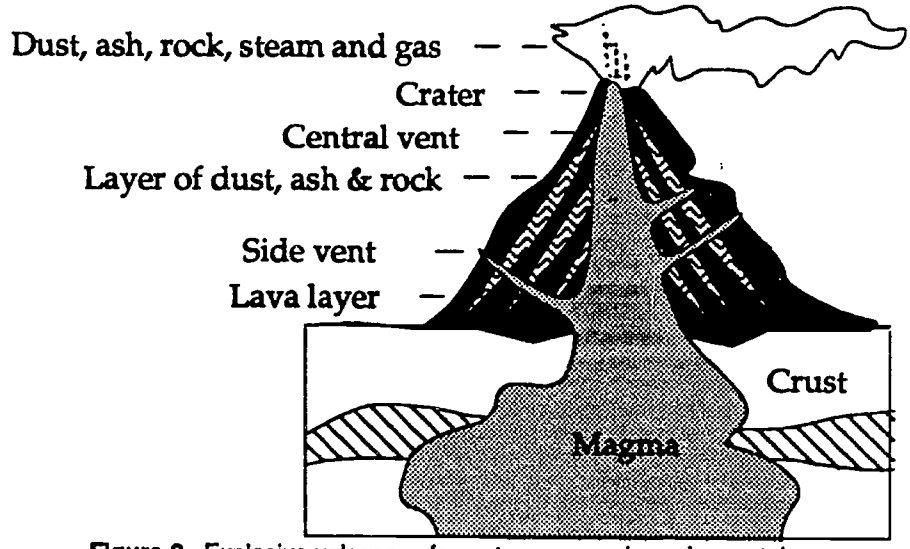


Figure 2 Explosive volcanoes form steep, cone-shaped mountains.

Other volcanoes erupt quietly, with the lava spreading out to form a flat, shield-shaped volcano. The volcanoes on the Hawaiian islands are like this. Sometimes the lava is thin and runny. At other times it is thick and lumpy, like porridge, and hardly flows at all.

Volcanoes also produce gases, and many of these are poisonous. When lava contains a lot of gas, it may froth violently. When this lava cools, the rock that forms is full of holes where the gas bubbles used to be.

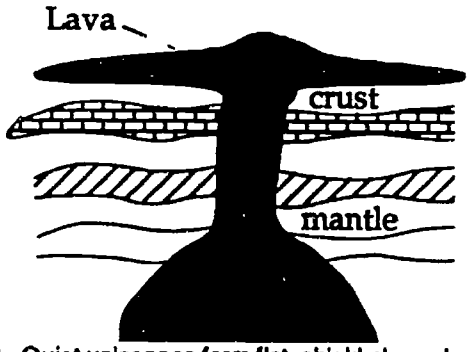


Figure 3 Quiet volcanoes form flat, shield-shaped mountains.

There are about 500 active volcanoes around the world. There are no active volcanoes in Australia, but there are many extinct ones: for example, Mount Warning in New South Wales and Mount Gambier in South Australia.

Adapted from: Stannard, Peter and Williamson, Ken. 1990. *Science Now: Book 1*, Macmillan, Melbourne.

29. Magma is

A. molten rock.
B. molten lava.
C. hot ash.
D. poisonous gas.

PER CENT CORRECT = 79.26%

32. How is magma forced through the Earth's crust ?

A. Pressure from surrounding rocks
B. Pressure from a solid plug
C. Magma becoming too hot
D. Too much gas building up

PER CENT CORRECT = 58.74%

33. A volcano is formed when

A. lava reaches 1000°C.
B. magma escapes through the Earth's crust.
C. pressure builds up in the Earth.
D. steam escapes from cracks in the Earth.

PER CENT CORRECT = 65.53%

34. What is meant by a "dormant" volcano ?

A. One that will never erupt again
B. One that has never erupted
C. A volcano like those in Australia
D. A volcano that can awaken at any time

PER CENT CORRECT = 68.57%

35. Magma becomes lava

A. when it cools to form rock.
B. when it is under the Earth's crust.
C. when it reaches the Earth's surface.
D. when it becomes hot ash.

PER CENT CORRECT = 67.75%

36. A volcano is extinct when it

A. stops erupting for many years.
B. never erupts again.
C. builds up pressure inside.
D. forms into a flat shield-shaped mountain.

PER CENT CORRECT = 67.43%

37. Look at Figure 1. The hard lump of toothpaste that forms in the tube acts the same way as

A. a plug in the vent of a volcano.
B. magma oozing from a volcano.
C. a violently erupting volcano.
D. pressure from gases in a volcano.

PER CENT CORRECT = 63.90%

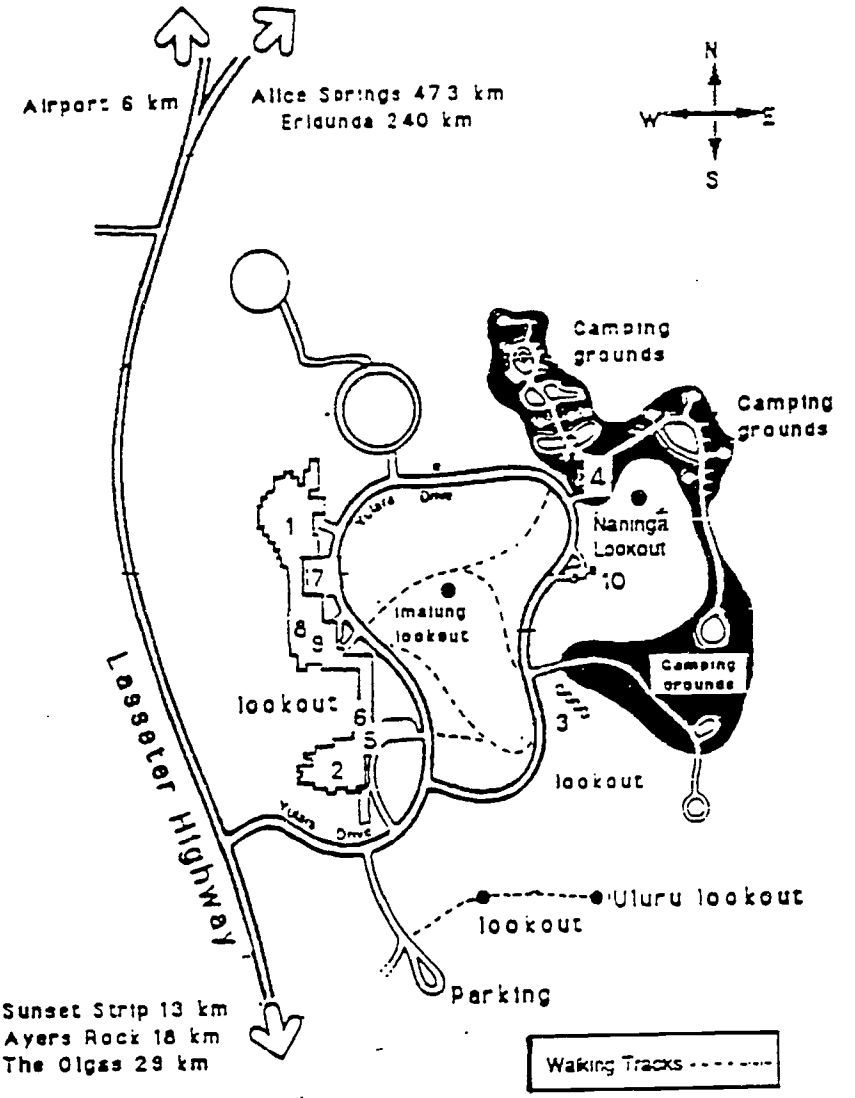
39. At present, Mount St Helens is

A. a quiet volcano.
B. an exploding volcano.
C. an extinct volcano.
D. a sleeping volcano.

PER CENT CORRECT = 61.07%

APPENDIX VIII: YEAR 7 READING FOR DIFFERENT PURPOSES SAMPLE QUESTIONS

YULARA TOURIST RESORT



1. SHERATON AYERS ROCK HOTEL
2. FOUR SEASONS YULARA RESORT
3. AYERS ROCK LODGE
4. AYERS ROCK CAMPGROUND
5. VISITORS DISPLAY AND INFORMATION CENTRE
6. THEATRETTE AND AMPHITHEATRE
   - IN VISITORS CENTRE. Venue for slide shows and park rangers' talks. Park Rangers on duty. Open 9am to 7pm
7. YULARA'S COMMUNITY SQUARE
   Hall, creche, children's and outdoor auditorium. The ambulance station, medical and dental suites are adjacent to this area.
8. SHOPPING FACILITIES
   include a supermarket, tour agency, fast film processing, ANZ Bank, newsagency/souvenir/ post office, and a milk bar and fast-food service.
9. THE ERNEST GILES TAVERN
   Food Entertainment Disco
10. MOBIL YULARA AYERS ROCK
    Spare Parts, Tyre and Mechanical Repairs

10. How many lookouts are indicated on the map?

A. 3
B. 4
C. 5
D. 6

PER CENT CORRECT = 60.65%

11. If you were standing on Imalung lookout in which direction would the Yulara Community Square be?

A. Northwest
B. West
C. Southwest
D. North

PER CENT CORRECT = 60.70%

12. Park Rangers are on duty at

A. 9 pm.
B. 6 pm.
C. 7 am.
D. 8 am.

PER CENT CORRECT = 62.11%

13. What is the venue for the slide shows and Park Rangers' talks?

A. Outdoor auditorium
B. The Ernest Giles Tavern
C. Theatrette and Amphitheatre
D. Display and information centre

PER CENT CORRECT = 81.03%

14. How far is it from Yulara Tourist Resort to The Olgas?

Ans: _____ km

PER CENT CORRECT = 85.04%

15. To get to Uluru lookout, you have to go

A. by four wheel drive.
B. on foot.
C. on a bus.
D. by car.

PER CENT CORRECT = 88.78%

16. If you take a trip to The Olgas, in what direction must you travel from Yulara Tourist Resort?

A. North
B. East
C. South
D. West

PER CENT CORRECT = 79.89%

17. Near which number on the map would you find a doctor?

A. 3
B. 5
C. 7
D. 9

PER CENT CORRECT = 89.70%

APPENDIX IX: NON-URBAN SCHOOLS READING COMPREHENSION SAMPLE QUESTIONS

PASSAGE 5

Magpie geese cause concern.....

Many Aboriginal people who regularly eat geese are worried about their family's health, since they found out that some magpie geese have been poisoned by lead bullets.

It has been discovered that large numbers of magpie geese in the swamps have a sickness from eating the lead shot left by hunters. Many birds that were tested had traces of lead in their guts.

The NT Government has now stopped people shooting with lead shot in the following places: Howard Springs Hunting Reserve, Harrison Dam, Lambell's Lagoon, and Marrakai Reserve. Hunters will be forced to change to steel shot if they want to hunt on these reserves.

Some Aboriginal people have asked the Health Clinic to test their blood so that they can find out if they have been affected. Annie Bonson, an Aboriginal health worker, who has been taking blood samples, has so far found that no one has been affected by lead poisoning.

NT Aboriginal News, Vol.6. No.4 1990 Office of Aboriginal Communications.

41. What is the **title** of the newspaper report?

A. Magpie geese cause concern
B. Aboriginal people eat geese
C. Lead Poisoning in the Territory
D. Hunting in the swamps

PER CENT CORRECT = 37.14%

42. It has been found that a large number of magpie geese have a sickness from

A. drinking bad water.
B. eating steel shot.
C. eating bad food.
D. eating lead shot.

PER CENT CORRECT = 35.19%

43. Who has left the lead shot in the swamps?

Ans. _____

PER CENT CORRECT = 23.38%

44. The NT Government has stopped people using

A. spears.
B. lead shot.
C. rifles.
D. steel shot.

PER CENT CORRECT = 36.09%

45. The Aboriginal health worker in the report is called

A. Harrison.
B. Marrakai.
C. Annie Bonson.
D. Mrs Howard.

PER CENT CORRECT = 35.79%

46. Where were traces of lead found in the geese?

A. In their feathers
B. In their guts
C. On their skin
D. In their blood

PER CENT CORRECT = 27.89%

47. Name two places where lead shot is **not** allowed to be used.

Ans. _____
Ans. _____

PER CENT CORRECT = 21.65%

48. Annie Bonson has found that

A. many people have lead poisoning.
B. some people have lead poisoning.
C. a few people have lead poisoning.
D. no one has lead poisoning.

PER CENT CORRECT = 32.33%

49. People are concerned about their family's health because

A. the geese are all gone.
B. the geese might have lead poisoning.
C. blood tests are taken.
D. babies are getting sick.

PER CENT CORRECT = 24.14%

50. What is the report **mainly** about?

A. The NT Government
B. Aboriginal health workers
C. Hunting
D. Lead poisoning

PER CENT CORRECT = 25.11%

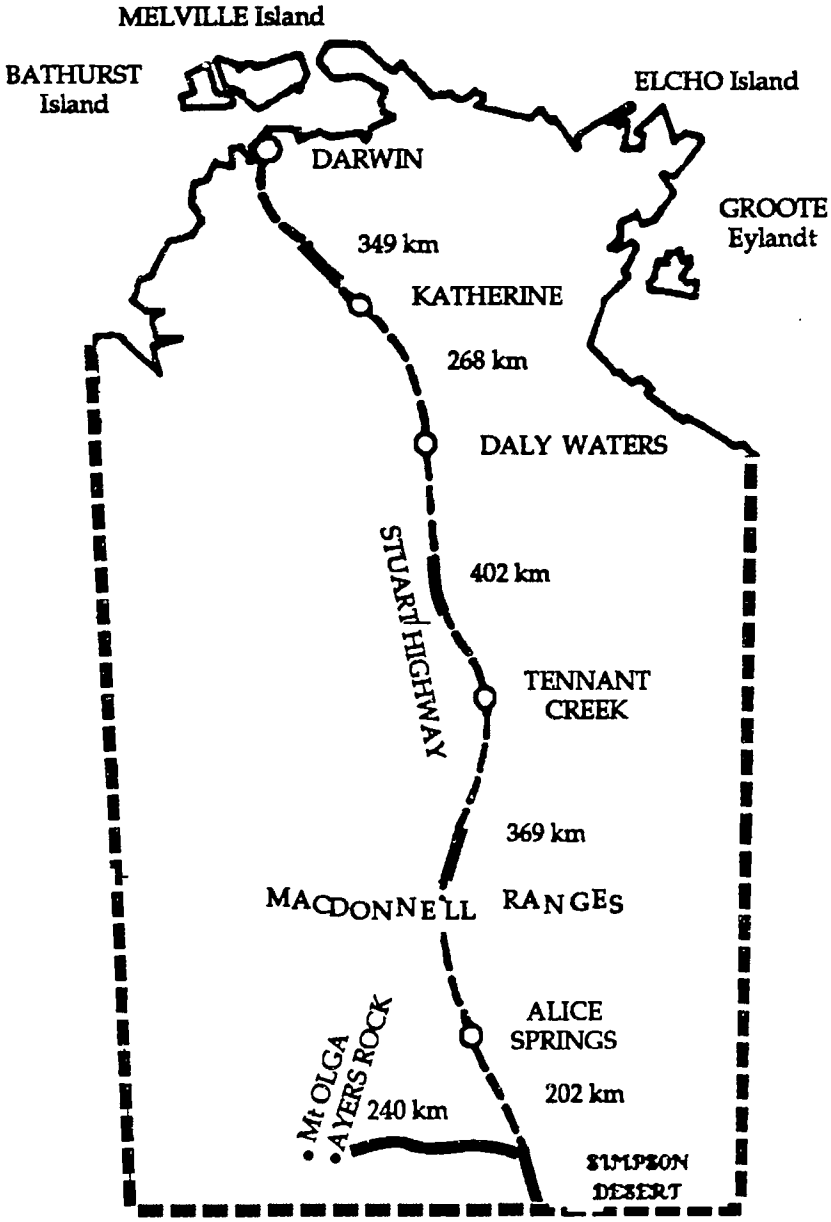
51. What is the **main idea** of paragraph three?

A. Taking blood samples
B. Eating geese
C. Banning lead shot
D. Getting sick

PER CENT CORRECT = 14.59%

APPENDIX X: NON-URBAN SCHOOLS READING FOR DIFFERENT PURPOSES SAMPLE QUESTIONS

MAP OF THE NORTHERN TERRITORY



5. What island is **closest** to Melville Island?

A. Groote
B. Elcho
C. Bathurst
D. Croker

PER CENT CORRECT = 64.40%

6. Name the ranges **near** Alice Springs.

A. Simpson
B. MacDonnell
C. Ayers Rock
D. Mt. Olga

PER CENT CORRECT = 44.73%

7. How **far** is it from Tennant Creek to Daly Waters?

A. 268 km
B. 349 km
C. 369 km
D. 402 km

PER CENT CORRECT = 61.52%

8. Name the **closest** place to Mt. Olga.

A. MacDonnell Ranges
B. Simpson Desert
C. Alice Springs
D. Ayers Rock

PER CENT CORRECT = 54.14%

9. What town is **349 km** from Katherine?

A. Daly Waters
B. Darwin
C. Alice Springs
D. Tennant Creek

PER CENT CORRECT = 60.25%

APPENDIX XI: Test statistics

Urban Schools Year 5 tests:

Testcode (Mathematics)	:	**URMA591**
Number of items	:	60
Mean test score	:	34.68
Standard deviation	:	11.95
KR#20 reliability	:	0.93
Standard error of measurement	:	3.19
Number of students	:	1924
Testcode (Comprehension)	:	**UREC591**
Number of items	:	40
Mean test score	:	26.8
Standard deviation	:	7.51
KR#20 reliability	:	0.89
Standard error of measurement	:	2.48
Number of students	:	1892
Testcode (RDP)	:	**URER591**
Number of items	:	33
Mean test score	:	24
Standard deviation	:	6.66
KR#20 reliability	:	0.89
Standard error of measurement	:	2.17
Number of students	:	1877

Urban Schools Year 7 tests:

Testcode (Mathematics)	:	**URMA791**
Number of items	:	60.00
Mean test score	:	32.71
Standard deviation	:	13.74
KR#20 reliability	:	0.95
Standard error of measurement	:	3.22
Number of students	:	1853
Testcode (Comprehension)	:	**UREC791**
Number of items	:	39
Mean test score	:	26.9
Standard deviation	:	7.45
KR#20 reliability	:	0.88
Standard error of measurement	:	2.53
Number of students	:	1842
Testcode (RDP)	:	**URER791**
Number of items	:	35
Mean test score	:	28.8
Standard deviation	:	5.99
KR#20 reliability	:	0.89
Standard error of measurement	:	1.92
Number of students	:	1845

Non-urban Schools tests:

Testcode (Mathematics)	:	**ABMAX91**
Number of items	:	60
Mean test score	:	26.40
Standard deviation	:	13.60
KR#20 reliability	:	0.95
Standard error of measurement	:	3.14
Number of students	:	1713
Testcode (Comprehension)	:	**ABECX91**
Number of items	:	65
Mean test score	:	24.8
Standard deviation	:	19.5
KR#20 reliability	:	0.97
Standard error of measurement	:	2.94
Number of students	:	1330
Testcode (RDP)	:	**ABERX91**
Number of items	:	53
Mean test score	:	26
Standard deviation	:	16.7
KR#20 reliability	:	0.97
Standard error of measurement	:	2.74
Number of students	:	1424

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