

Appendix A
General Policy Concerns, Specific Research Questions, and Dummy Tables
for the Design of the SACMEQ II Project

General Policy Concern 1: What were the personal characteristics (for example, age and gender) and home background characteristics (for example, parent education, regularity of meals, home language, etc.) of Grade 6 pupils that might have implications for monitoring equity, and/or that might impact upon teaching and learning?

Specific Research Questions

- What was the age distribution of pupils?
Questionnaire: SI: P2; SII: P2
Dummy Table: 3.1(a), 3.1(b)
- What was the gender distribution of pupils?
Questionnaire: SI: P3 ; SII: P3
Dummy Table: 3.1(a), 3.1(b)
- What was the level of the parents' education?
Questionnaire: SI: P9, P10; SII: P11, P12
Dummy Table: 3.1(a), 3.1(b), 11.17(a), 11.17(b)
- How regularly did pupils eat meals?
Questionnaire: SI: P18; SII: P10
Dummy Table: 3.1(a), 3.1(b)
- What percentage of pupils spoke the language of the test at home?
Questionnaire: SI: P4; SII: P4
Dummy Table: 3.2(a), 3.2(b)
- Where did pupils live during the school week?
Questionnaire: SI: P5; SII: P5
Dummy Table: 3.3(a), 3.3(b)
- How many books were there in pupils' homes?
Questionnaire: SI: P6; SII: P6
Dummy Table: 3.1(a), 3.1(b)
- What other reading materials and electronic media did pupils have at home?
Questionnaire: SI: P8.01, P8.02, P8.03, P8.04, P8.05, P8.06, P8.07 ;
SII: P7.01, P7.02, P7.03, P7.04, P7.05, P7.06, P7.07
Dummy Table: 3.1(a), 3.1(b)
- What was the socio-economic status of pupils' parents in terms of possessions, housing conditions (lighting, floor, wall, roof), and livestock?
Questionnaire: SI: P8 ; SII: P7, P8, P9, P13, P14, P15
Dummy Table: 3.1(a), 3.1(b), 3.4(a), 3.4(b), 3.4(c), 3.4(d), 3.4(e), 3.5

General Policy Concern 2: What were the school context factors experienced by Grade 6 pupils (such as location, absenteeism (regularity and reasons), grade repetition, and homework (frequency, amount, correction, and family involvement)) that might impact upon teaching/learning and the general functioning of schools?

Specific Research Questions

- What was the location of the school?

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Questionnaire: SI: S11, S12; SII: S13, S14

Dummy Table: 7.2

- How many days were pupils absent in the previous month, and what were the reasons for these absences?

Questionnaire: SI: P19; SII: P16, P17

Dummy Table: 3.2(a), 3.2(b), 3.2(c)

- How many pupils had repeated a grade, and were they currently repeating Grade 6?

Questionnaire: SI: P23; SII: P18

Dummy Table: 3.2(a), 3.2(b)

- How frequently did pupils receive homework in reading and mathematics?

Questionnaire: SI: P11; SII: P33, P36

Dummy Table: 8.4(a)

- Did the teachers correct assigned homework?

Questionnaire: SII: P34, P37

Dummy Table: 8.4(b), 8.4(c)

- Did family members monitor, assist with, request demonstrations, ask questions about, and/or look at, pupils' homework?

Questionnaire: : SI: P12, P13, P14, P15, P16; SII: P24, P25, P26, P27, P28, P29, P30

Dummy Table: 9.7(a), 9.7(b), 9.7(c)

General Policy Concern 3: Did Grade 6 pupils have sufficient access to classroom materials (for example, textbooks, readers, and stationery) in order to participate fully in their lessons?

Specific Research Questions

- What percentage of students had reading and mathematics textbooks?

Questionnaire: : SI: P20; SII: P35, P38

Dummy Table: 6.4

- What percentage of pupils had adequate basic classroom supplies for writing, ruling, erasing, etc.?

Questionnaire: : SI: P22; SII: P21

Dummy Table: 6.5(a), 6.5(b)

General Policy Concern 4: Did Grade 6 pupils have access to library books within their schools, and (if they did have access) was the use of these books being maximized by allowing pupils to take them home to read?

Specific Research Questions

- What percentage of pupils had access to (school and classroom) library facilities?

Questionnaire: : SI: T10.9, S31.01; SII: T12.6, S38.01

Dummy Table: 6.1, 7.3

- Were pupils permitted to take library books home? (This question to be crosschecked from pupil and school head questionnaires.)

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Questionnaire: : SI: P21, S34; SII: P20, S39
Dummy Table: 11.1

General Policy Concern 5: Has the practice of Grade 6 pupils receiving extra lessons in school subjects outside school hours become widespread, and have these been paid lessons?

Specific Research Questions

- What percentage of pupils received extra tuition?
Questionnaire: : SI: P17; SII: P31
Dummy Table: 8.3(a)
- Was payment made for receiving extra tuition?
Questionnaire: : SII: P32
Dummy Table: 8.3(b)

General Policy Concern 6: What were the personal characteristics of Grade 6 teachers (for example, age, gender, and socio-economic level), and what was the condition of their housing?

Specific Research Questions

- What was the age distribution of teachers?
Questionnaire: SI: T3; SII: T3
Dummy Table: 4.1(a), 4.1(b)
- What was the gender distribution of teachers?
Questionnaire: SI: T2; SII: T2
Dummy Table: 4.1(a), 4.1(b)
- What was the socio-economic status of teachers in terms of possessions and livestock?
Questionnaire: SI: T28; SII: T27, T28
Dummy Table: 4.1(a), 4.1(b), 11.2(a), 11.2(b)
- What was the general condition (repair status and lighting) of teacher housing?
Questionnaire: SI: T31; SII: T29, T30,
Dummy Table: 4.5, 11.3(a), 11.3(b)

General Policy Concern 7: What were the professional characteristics of Grade 6 teachers (in terms of academic, professional, and in-service training), and did they consider in-service training to be effective in improving their teaching?

Specific Research Questions

- How many years of academic education had teachers completed?
Questionnaire: SI: T4; SII: T4
Dummy Table: 4.3(a), 4.3(b), 4.3(c)
- How many years of teacher training had teachers completed?
Questionnaire: SI: T5; SII: T5
Dummy Table: 4.2(a), 4.2(b)

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- How many years of teaching experience had teachers completed?
Questionnaire: SI: T6; SII: T6
Dummy Table: 4.2(a), 4.2(b)
- How much in-service training had teachers completed?
Questionnaire: SI: T7; SII: T7, T8
Dummy Table: 4.4(a), 4.4(b)
- Did teachers consider that in-service training improved their teaching?
Questionnaire: SII: T9
Dummy Table: 9.8

General Policy Concern 8: How did Grade 6 teachers allocate their time among responsibilities concerned with teaching, preparing lessons, and marking?

Specific Research Questions

- How many periods did teachers teach and how long were these periods?
Questionnaire: SI: T11, T12; SII: T14, T15
Dummy Table: 11.4
- How many hours per week did teachers spend in lesson preparation and marking?
Questionnaire: SI: T13; SII: T16
Dummy Table: 8.5

General Policy Concern 9: What were Grade 6 teachers' viewpoints on (a) pupil activities within the classroom (for example, reading aloud, pronouncing, etc.), (b) teaching goals (for example, making learning enjoyable, word attack skills, etc.) (c) teaching approaches/strategies (for example, questioning, whole class teaching, etc.), (d) assessment procedures, and (e) meeting and communicating with parents?

Specific Research Questions

- What did teachers consider to be the most important pupil activities for teaching reading and mathematics?
Questionnaire: SI: T15; SII: T33, T41
Dummy Table: 8.1(a)(i), 8.1(b)(i)
- What did teachers consider to be the most important teaching goals in reading and mathematics?
Questionnaire: SI: T18; SII: T36, T44
Dummy Table: 8.1(a)(ii), 8.1(b)(ii)
- What teaching approaches/strategies were used most frequently by reading and mathematics teachers?
Questionnaire: SI: T19; SII: T37, T45
Dummy Table: 8.1(a)(iii), 8.1(b)(iii)
- How often did teachers give written tests in reading and mathematics?
Questionnaire: SI: T20; SII: T38, T46
Dummy Table: 8.1(a)(iv), 8.1(b)(iv)

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- Was there a specific section in pupil school reports for reading and mathematics?
Questionnaire: SI: T22; SII: T31, T39
Dummy Table: 11.5
- How often did teachers meet with parents each year?
Questionnaire: SI: T21; SII: T17
Dummy Table: 9.3
- What percentage of parents met with teachers each year?
Questionnaire: SII: T18
Dummy Table: 11.6
- Did teachers ask parents to sign homework assignments?
Questionnaire: SI: T16; SII: T34, T42
Dummy Table: 11.7

General Policy Concern 10: What was the availability of classroom furniture (for example, sitting/writing places, teacher table, teacher chair, and bookshelves) and classroom equipment (for example, chalkboard, dictionary, maps, book corner, and teacher guides) in Grade 6 classrooms?

Specific Research Questions

- What percentages of pupils were in classrooms with adequate sitting and writing places?
Questionnaire: SI: P24, P25; SII: P22, P23
Dummy Table: 6.3
- What percentages of pupils were in classrooms with adequate classroom furniture and equipment (for example, a teacher table, teacher chair, bookshelves, and chalkboard)?
Questionnaire: SI: T10; SII: T12
Dummy Table: 6.1, 6.2
- How many books did teachers have in their classroom library or book corner?
Questionnaire: SI: T8; SII: T10
Dummy Table: 11.8
- Did teachers have teaching aids (for example, a map, dictionary, geometrical instruments, and teachers' guides)?
Questionnaire: SII: T13.1, T13.2, T13.3, T13.4, T13.5
Dummy Table: 11.9(a), 11.9(b)

General Policy Concern 11: What professional support (in terms of education resource centres, inspections, advisory visits, and school head inputs) was given to Grade 6 teachers?

Specific Research Questions

- Did teachers use education resource centres?
Questionnaire: SII: T24
Dummy Table: 8.6
- How did teachers use education resource centres?

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Questionnaire: SII: T24, T24.1, T24.2, T24.3, T24.4, T24.5, T24.6

Dummy Table: 11.10(a), 11.10(b)

- What support did Advisors or Inspectors give to teachers in terms of administrative, professional, and pedagogical matters?

Questionnaire: SII: T20, T21

Dummy Table: 9.9

- Did school heads advise teachers on their teaching?

Questionnaire: SI: T25; SII: T22

Dummy Table: 9.2

General Policy Concern 12: What factors had most impact upon teacher job satisfaction?

Specific Research Questions

- What factors (for example, living conditions, school facilities/equipment, staff relationships, career advancement, salaries, etc.) had most impact upon teachers' job satisfaction?

Questionnaire: SI: T26; SII: T25

Dummy Table: 9.1

- What did teachers rate as the most important factor?

Questionnaire: SI: T27; SII: T26

Dummy Table: 11.11

General Policy Concern 13: What were the personal characteristics of school heads (for example, age and gender)?

Specific Research Questions

- What was the age distribution of school heads?

Questionnaire: SI: S2; SII: S2

Dummy Table: 5.1

- What was the gender distribution of school heads?

Questionnaire: SI: S1; SII: S1

Dummy Table: 5.1

General Policy Concern 14: What were the professional characteristics of school heads (in terms of academic, professional, experience, and specialized training)?

Specific Research Questions

- How many years of academic education had school heads completed?

Questionnaire: SI: S3; SII: S3

Dummy Table: 11.12(a), 11.12(b)

- How many years of teacher training had school heads completed?

Questionnaire: SI: S4; SII: S4

Dummy Table: 5.2

- How many years of teaching experience had school heads completed?

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Questionnaire: SI: S5; SII: S6

Dummy Table: 5.2

- How many years of experience had school heads had either as a school head or an acting school head – in the current school and all together?

Questionnaire: SI: S8, S9; SII: S9, S10

Dummy Table: 11.13

- Have school heads received specialized training in school management?

Questionnaire: SII: S5

Dummy Table: 5.2

General Policy Concern 15: What were the school heads' viewpoints on general school infrastructure (for example, electrical and other equipment, water, and basic sanitation) and the condition of school buildings?

Specific Research Questions

- What items of equipment (telephone, fax, photocopier) and general facilities (library, staff room, store room) did schools have?

Questionnaire: SI: S31; SII: S38

Dummy Table: 7.3

- What kind of water supply did schools have?

Questionnaire: SI: S31.10; SII: S38.08

Dummy Table: 7.3

- What was the nature and provision of toilet facilities in schools?

Questionnaire: SI: S30; SII: S37

Dummy Table: 7.1

- What was the general condition of school buildings?

Questionnaire: SI: S29; SII: S36

Dummy Table: 7.1

General Policy Concern 16: What were the school heads' viewpoints on (a) daily activities (for example, teaching, school-community relations, and monitoring pupil progress), (b) organizational policies (for example school magazine, open days, and formal debates), (c) inspections, (d) community input, (e) problems with pupils and staff (for example, pupil lateness, teacher absenteeism, and lost days of school)?

Specific Research Questions

- What amount of teaching did school heads undertake?

Questionnaire: SI: S7; SII: S7, S8

Dummy Table: 5.3

- What level of importance did school heads attach to activities such as community contacts, monitoring pupil progress, administrative tasks, etc.?

Questionnaire: SI: S22; SII: S28

Dummy Table: 9.4

- What was the incidence of school activities such as a school magazine, public speaking day, "open days, etc.?"

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Questionnaire: SI: S24; SII: S30

Dummy Table: 8.2

- How many school days were lost in the last school year due to non-school events?

Questionnaire: SI: S26; SII: S33

Dummy Table: 7.4

- What were the purposes and frequency of school inspections?

Questionnaire: SII: S24, S25

Dummy Table: 8.7, 11.14

- What was the contribution of the school community (in terms of time and resources for maintaining the school and for providing supplementary funding)?

Questionnaire: SII: S40

Dummy Table: 9.10

- What were the main behavioural problems of pupils?

Questionnaire: SI: S25; SII: S31

Dummy Table: 9.5(a), 9.5(b)

- What were the main behavioural problems of teachers?

Questionnaire: SI: S25; SII: S32

Dummy Table: 9.6(a), 9.6(b)

General Policy Concern 17: Have human resources (for example, qualified and experienced teachers and school heads) been allocated in an equitable fashion among regions and among schools within regions?

Specific Research Questions

- Were qualified and experienced Grade 6 teachers and school heads distributed equitably among regions and among schools within regions?

Questionnaire: SI: T4, T5, T6, T23, S3, S4, S5, S13, S18; SII: T4, T5, T6, T19, S3, S4, S6, S15, S18

Dummy Table: 11.15(a), 11.15(b)

General Policy Concern 18: Have material resources (for example, classroom teaching materials and school facilities) been allocated in an equitable fashion among regions and among schools within regions?

Specific Research Questions

- Were (a) general school infrastructure, (b) classroom equipment, and (c) classroom teaching materials distributed equitably among regions and among schools within regions?

Questionnaire: SI: T10, T31, S20, S28, S30, S31; SII: T12, T30, S22, S35, S37, S38

Dummy Table: 11.16(a), 11.16(b)

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General Policy Concern 19: What were the levels (according to Rasch scores and descriptive levels of competence) and variations (among schools and regions) in the achievement levels of Grade 6 pupils and their teachers in reading and mathematics – for my country and for all other SACMEQ countries?

Specific Research Questions

- What were the overall mean Rasch scores of pupils and their teachers in reading and mathematics across the SACMEQ countries?
Questionnaire: SI: PRT; SII: PRT, PMT, TRT, TMT
Dummy Table: 11.18(a), 11.18(b)
- What were the percentages of between and within school variance associated with pupil Rasch scores in reading and mathematics across the SACMEQ countries?
Questionnaire: SI: PRT; SII: PRT, PMT, TRT, TMT
Dummy Table: 11.19(a), 11.19(b)
- What were the overall percentages of pupils and their teachers across the various levels of competence in reading and mathematics across the SACMEQ countries?
Questionnaire: SI: PRT; SII: PRT, PMT, TRT, TMT
Dummy Table: 11.20(a), 11.20(b)

General Policy Concern 20: What were the reading and mathematics achievement levels of important sub-groups of Grade 6 pupils and their teachers (for example, pupils and teachers of different genders, socio-economic levels, and locations)?

Specific Research Questions

- What were the gender differences in reading and mathematics achievement for pupils and teachers?
Questionnaire: SI: PRT, P3; SII: PRT, PMT, TRT, TMT, P3, T2
Dummy Table: 11.21
- What were the school location differences in reading and mathematics achievement for pupils and teachers?
Questionnaire: SI: PRT, S12; SII: PRT, PMT, TRT, TMT, S14
Dummy Table: 11.22
- What were the socioeconomic differences in reading and mathematics achievement for pupils and teachers?
Questionnaire: SI: PRT, P8; SII: PRT, PMT, TRT, TMT, P7, T27
Dummy Table: 11.23

Appendix B

Reading Test Items Considered to be Central to the Core Curriculum in Each Country)

item #	Type	BOT	KEN	LES	MAL	MAU	MOZ	NAM	SEY	SOU	SWA	TAN	UGA	ZAM	ZAN
1	Word recognition	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes
2		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes
3		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes
4		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes
5		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes
6		Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes		Yes	Yes	Yes	Yes
7	Sentence completion with a word	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
8		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
9			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
10		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes
11			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	
12	Sentence completion with a phrase	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
13		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
14			Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
15	Narrative	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
16		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
17		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
18	Document	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
19		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
20		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
21		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
22	Narrative	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
23		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
24		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
25		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
26	Document	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes
27		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes
28		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes
29	Expository	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
30		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
31				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
32		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
33	Document	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
34		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
35	Document	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
36		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
37		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
38		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
39		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
40		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

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Item #	Type	BOT	KEN	LES	MAL	MAU	MOZ	NAM	SEY	SOU	SWA	TAN	UGA	ZAM	ZAN
41	Expository	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
42		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
43		Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes		Yes
44		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
45	Narrative	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
46		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
47		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
48		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
49		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes
50	Expository	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
51		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
52		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
53		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
54	Documents	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes		Yes	Yes	Yes	Yes
55		Yes	Yes	Yes	Yes	Yes		Yes		Yes	Yes	Yes	Yes	Yes	Yes
56		Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
57		Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
58	Expository	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes
59		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes
60		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes
61	Narrative	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
62		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
63		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
64		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
65	Expository	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
66		Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
67		Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
68				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
69		Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes
70	Expository	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
71		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
72		Yes	Yes			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
73	Document	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes
74		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes
75		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes
76		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes
77	Expository	Yes	Yes	Yes	Yes		Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes
78							Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes
79		Yes	Yes	Yes	Yes		Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes
80	Expository						Yes			Yes	Yes	Yes	Yes		Yes
81							Yes			Yes	Yes	Yes	Yes		Yes
82		Yes					Yes			Yes	Yes	Yes	Yes		Yes
83							Yes			Yes	Yes	Yes	Yes		Yes

Note: The shaded items were excluded from the final analyses because they failed a Rasch “differential item functioning” test across three groups: SACMEQ I pupils, SACMEQ II pupils, and SACMEQ II teachers.

Appendix C

Mathematics Test Items Considered to be Central to the Core Curriculum in Each Country)

Item #	Type	BOT	KEN	LES	MAL	MAU	MOZ	NAM	SEY	SOU	SWA	TAN	UGA	ZAM	ZAN
1	Number	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes
2	Number	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes
3	Number	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes
4	Number	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
5	Space/Data	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
6	Space/Data	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
7	Space/Data	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
8	Number	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
9	Measurement	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
10	Number	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
11	Number	Yes	Yes	Yes			Yes	Yes		Yes	Yes	Yes	Yes	Yes	
12	Number	Yes	Yes	Yes	Yes			Yes		Yes	Yes	Yes	Yes	Yes	Yes
13	Number	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
14	Number	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
15	Measurement	Yes	Yes	Yes	Yes	Yes		Yes		Yes	Yes	Yes	Yes	Yes	Yes
16	Measurement	Yes	Yes	Yes	Yes	Yes		Yes		Yes	Yes	Yes	Yes	Yes	Yes
17	Measurement	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
18	Measurement	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
19	Measurement	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
20	Measurement	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
21	Space/Data	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
22	Number	Yes	Yes	Yes	Yes			Yes		Yes	Yes	Yes	Yes	Yes	Yes
23	Measurement	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
24	Measurement	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
25	Space/Data	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
26	Space/Data	Yes		Yes		Yes		Yes		Yes	Yes	Yes	Yes		
27	Number	Yes	Yes				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
28	Number	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
29	Number	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	
30	Space/Data	Yes	Yes	Yes			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
31	Measurement	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
32	Space/Data	Yes	Yes		Yes	Yes	Yes			Yes		Yes	Yes		
33	Space/Data	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
34	Number	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes
35	Number	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes
36	Number	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
37	Measurement	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
38	Number	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
39	Space/Data	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes
40	Space/Data	Yes	Yes	Yes			Yes	Yes	Yes	Yes	Yes	Yes	Yes		

Appendix C (Ctd.)

item #	Type	BOT	KEN	LES	MAL	MAU	MOZ	NAM	SEY	SOU	SWA	TAN	UGA	ZAM	ZAN
41	Number	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
42	Measurement	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
43	Number	Yes			Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
44	Measurement	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	
45	Measurement	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
46	Number	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
47	Measurement	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
48	Measurement	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
49	Measurement	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
50	Measurement	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
51	Measurement	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
52	Space/Data	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
53	Space/Data	Yes	Yes		Yes	Yes	Yes			Yes	Yes	Yes	Yes	Yes	
54	Measurement	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
55	Measurement	Yes				Yes	Yes			Yes	Yes	Yes	Yes		
56	Number	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
57	Number	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
58	Space/Data	Yes		Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	
59	Number	Yes	Yes		Yes			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
60	Number	Yes	Yes		Yes			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
61	Number	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
62	Number	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
63	Measurement	Yes				Yes	Yes			Yes	Yes	Yes	Yes	Yes	

Note: The shaded items were excluded from the final analyses because they failed a Rasch “differential item functioning” test across three groups: SACMEQ I pupils, SACMEQ II pupils, and SACMEQ II teachers.

Appendix D

Sample Design Tables for $\rho = 0.1, 0.2, 0.3$

Cluster Size b	95% Confidence Limits for Means/Percentages							
	$\pm 0.05s/\pm 2.5\%$		$\pm 0.1s/\pm 5.0\%$		$\pm 0.15s/\pm 7.5\%$		$\pm 0.2s/\pm 10.0\%$	
	a	n	a	n	a	n	a	n
<u>$\rho = 0.1$</u>								
1 (SRS)	1600	1600	400	400	178	178	100	100
2	880	1760	220	440	98	196	55	110
5	448	2240	112	560	50	250	28	140
10	304	3040	76	760	34	340	19	190
15	256	3840	64	960	29	435	16	240
20	232	4640	58	1160	26	520	15	300
30	208	6240	52	1560	24	720	13	390
40	196	7840	49	1960	22	880	13	520
50	189	9450	48	2400	21	1050	12	600
<u>$\rho = 0.2$</u>								
1 (SRS)	1600	1600	400	400	178	178	100	100
2	960	1920	240	480	107	214	60	120
5	576	2880	144	720	65	325	36	180
10	448	4480	112	1120	50	500	28	280
15	406	6090	102	1530	46	690	26	390
20	384	7680	96	1920	43	860	24	480
30	363	10890	91	2730	41	1230	23	690
40	352	14080	88	3520	40	1600	22	880
50	346	17300	87	4350	39	1950	22	1100
<u>$\rho = 0.3$</u>								
1 (SRS)	1600	1600	400	400	178	178	100	100
2	1040	2080	260	520	116	232	65	130
5	704	3520	176	880	79	395	44	220
10	592	5920	148	1480	66	660	37	370
15	555	8325	139	2085	62	930	35	525
20	536	10720	134	2680	60	1200	34	680
30	518	15540	130	3900	58	1740	33	990
40	508	20320	127	5080	57	2280	32	1280
50	503	25150	126	6300	56	2800	32	1600

Appendix D (Ctd.)

Sample Design Tables for $\rho = 0.4, 0.5, 0.6$

Cluster Size b	95% Confidence Limits for Means/Percentages							
	$\pm 0.05s/\pm 2.5\%$		$\pm 0.1s/\pm 5.0\%$		$\pm 0.15s/\pm 7.5\%$		$\pm 0.2s/\pm 10.0\%$	
	a	n	a	n	a	n	a	n
<u>$\rho = 0.4$</u>								
1 (SRS)	1600	1600	400	400	178	178	100	100
2	1120	2240	280	560	125	250	70	140
5	832	4160	208	1040	93	465	52	260
10	736	7360	184	1840	82	820	46	460
15	704	10560	176	2640	79	1185	44	660
20	688	13760	172	3440	77	1540	43	860
30	672	20160	168	5040	75	2250	42	1260
40	664	26560	166	6640	74	2960	42	1680
50	660	33000	165	8250	74	3700	42	2100
<u>$\rho = 0.5$</u>								
1 (SRS)	1600	1600	400	400	178	178	100	100
2	1200	2400	300	600	134	268	75	150
5	960	4800	240	1200	107	535	60	300
10	880	8800	220	2200	98	980	55	550
15	854	12810	214	3210	95	1425	54	810
20	840	16800	210	4200	94	1880	53	1060
30	827	24810	207	6210	92	2760	52	1560
40	820	32800	205	8200	92	3680	52	2080
50	816	40800	204	10200	91	4550	51	2550
<u>$\rho = 0.6$</u>								
1 (SRS)	1600	1600	400	400	178	178	100	100
2	1280	2560	320	640	143	286	80	160
5	1088	5440	272	1360	122	610	68	340
10	1024	10240	256	2560	114	1140	64	640
15	1003	15045	251	3765	112	1680	63	945
20	992	19840	248	4960	111	2220	62	1240
30	982	29460	246	7380	110	3300	62	1860
40	976	39040	244	9760	109	4360	61	2440
50	973	48650	244	12200	109	5450	61	3050

Appendix D (Ctd.)

Sample Design Tables for $\rho = 0.7, 0.8, 0.9$

Cluster Size b	95% Confidence Limits for Means/Percentages							
	$\pm 0.05s/\pm 2.5\%$		$\pm 0.1s/\pm 5.0\%$		$\pm 0.15s/\pm 7.5\%$		$\pm 0.2s/\pm 10.0\%$	
	a	n	a	n	a	n	a	n
<u>$\rho = 0.7$</u>								
1 (SRS)	1600	1600	400	400	178	178	100	100
2	1360	2720	340	680	152	304	85	170
5	1216	6080	304	1520	136	680	76	380
10	1168	11680	292	2920	130	1300	73	730
15	1152	17280	288	4320	129	1935	72	1080
20	1144	22880	286	5720	128	2560	72	1440
30	1136	34080	284	8520	127	3810	71	2130
40	1132	45280	283	11320	126	5040	71	2840
50	1130	56500	283	14150	126	6300	71	3550
<u>$\rho = 0.8$</u>								
1 (SRS)	1600	1600	400	400	178	178	100	100
2	1440	2880	360	720	161	322	90	180
5	1344	6720	336	1680	150	750	84	420
10	1312	13120	328	3280	146	1460	82	820
15	1302	19530	326	4890	145	2175	82	1230
20	1296	25920	324	6480	145	2900	81	1620
30	1291	38730	323	9690	144	4320	81	2430
40	1288	51520	322	12880	144	5760	81	3240
50	1287	64350	322	16100	144	7200	81	4050
<u>$\rho = 0.9$</u>								
1 (SRS)	1600	1600	400	400	178	178	100	100
2	1520	3040	380	760	170	340	95	190
5	1472	7360	368	1840	164	820	92	460
10	1456	14560	364	3640	162	1620	91	910
15	1451	21765	363	5445	162	2430	91	1365
20	1448	28960	362	7240	162	3240	91	1820
30	1446	43380	362	10860	161	4830	91	2730
40	1444	57760	361	14440	161	6440	91	3640
50	1444	72200	361	18050	161	8050	91	4550

Appendix E

Random Number Tables for the Selection of 20 Grade 6 Students within each Selected School

Case#	R21	R22	R23	R24	R25	R26	R27	R28	R29	R30	R31	R32	R33	R34	R35	Case#	R36	R37	R38	R39	R40	R41	R42	R43	R44	R45	R46	R47	R48	R49	R50
1	1	1	1	1	1	1	1	1	1	2	2	1	1	2	1	1	1	3	1	1	1	3	4	2	1	1	2	1	2	2	
2	2	2	2	2	2	2	2	2	3	3	3	2	3	3	3	2	5	2	5	6	2	2	5	4	5	5	2	2	3	2	4
3	3	3	3	3	3	3	3	3	4	4	6	3	4	4	4	3	6	3	6	7	4	6	6	6	6	6	3	6	5	6	5
4	4	4	4	4	4	5	4	6	5	7	7	5	5	6	6	4	8	4	7	8	7	7	8	10	13	8	4	11	7	9	6
5	5	5	5	5	5	6	5	7	6	8	8	7	7	9	7	5	10	7	10	11	10	8	11	12	15	9	10	12	8	10	8
6	6	6	6	6	6	7	6	8	7	9	9	8	9	12	12	6	11	8	11	13	11	10	13	13	16	10	11	13	10	13	9
7	7	7	7	7	7	8	7	11	8	10	11	9	11	14	13	7	13	9	12	15	14	11	14	15	19	12	15	17	13	15	14
8	8	8	8	8	8	10	8	12	9	11	12	10	12	15	15	8	14	12	16	17	16	12	17	16	22	13	19	18	17	16	21
9	9	9	9	9	12	11	9	13	10	13	13	11	14	17	16	9	17	14	17	18	17	13	18	20	23	15	20	20	18	17	22
10	10	10	11	11	13	13	10	14	12	14	14	13	15	18	17	10	18	15	24	19	18	15	20	26	26	17	21	21	19	23	23
11	11	11	12	12	14	14	11	15	13	15	17	14	16	19	20	11	19	16	25	21	21	17	22	28	28	22	26	27	20	32	24
12	13	13	13	15	15	15	12	16	16	17	18	16	17	21	21	12	23	17	26	23	22	19	23	32	33	23	30	28	21	33	25
13	14	14	15	17	16	16	16	17	19	18	20	17	19	23	22	13	24	19	27	26	23	22	24	33	34	25	31	29	25	34	27
14	15	15	16	18	17	17	18	19	20	19	22	20	21	27	23	14	25	20	29	28	24	23	25	34	35	27	33	30	28	35	29
15	16	16	17	19	18	20	19	20	22	20	24	23	22	28	24	15	26	24	30	31	30	26	29	35	36	29	35	35	30	36	31
16	17	18	18	20	19	21	20	21	24	22	26	25	24	29	25	16	30	28	31	33	32	28	30	36	37	30	37	43	32	38	33
17	18	19	20	21	20	22	22	22	25	23	27	27	27	30	28	17	31	30	32	34	34	29	31	38	38	34	38	44	34	41	34
18	19	20	21	22	21	23	23	23	26	24	28	29	30	31	32	18	33	31	33	35	35	31	33	39	39	36	40	45	39	45	40
19	20	21	22	23	23	24	25	24	27	25	29	30	32	32	33	19	35	32	35	36	37	38	34	42	40	41	44	46	44	48	43
20	21	22	23	24	24	25	26	25	29	27	31	31	33	34	34	20	36	35	38	39	39	41	35	43	41	44	45	47	48	49	50

Case#	R51	R52	R53	R54	R55	R56	R57	R58	R59	R60	R61	R62	R63	R64	R65	Case#	R66	R67	R68	R69	R70	R71	R72	R73	R74	R75	R76	R77	R78	R79	R80
1	1	2	3	3	1	6	2	1	1	1	2	4	8	2	3	1	4	1	4	1	4	3	6	1	2	1	1	4	3	7	6
2	3	3	4	5	8	7	5	3	3	2	5	6	15	6	6	2	10	6	6	7	9	5	8	3	7	3	5	7	4	8	12
3	4	5	5	6	9	8	9	6	5	15	10	8	18	7	8	3	11	9	7	10	10	9	10	4	8	21	7	12	13	11	13
4	10	6	8	15	10	12	13	9	7	16	11	11	20	8	14	4	12	15	9	20	14	12	13	9	10	23	17	15	14	13	14
5	15	12	12	16	11	14	15	10	8	17	21	12	21	9	15	5	16	19	10	21	15	14	14	13	14	28	18	18	16	28	27
6	18	16	17	17	13	16	20	12	12	18	22	19	23	13	17	6	19	22	11	25	18	17	16	14	19	30	19	19	20	29	28
7	19	18	21	18	21	19	22	23	16	19	23	25	26	14	21	7	26	23	13	29	20	22	22	17	23	34	23	20	32	39	30
8	23	21	27	20	24	20	25	25	21	20	24	29	33	18	22	8	27	26	15	30	21	25	23	18	26	37	26	21	34	40	31
9	24	24	29	21	25	21	31	27	24	24	27	33	35	23	25	9	28	30	17	32	27	28	24	19	36	41	28	25	41	41	33
10	28	26	30	23	26	24	33	32	28	25	28	34	36	26	29	10	31	36	25	33	38	29	27	22	38	42	29	26	42	42	35
11	29	27	31	25	27	25	36	33	29	26	31	35	37	28	33	11	34	41	32	35	39	38	30	24	41	44	33	32	48	51	36
12	33	29	32	27	31	26	38	38	31	31	32	36	40	29	35	12	44	48	33	38	43	41	31	29	45	45	41	34	53	53	40
13	35	32	33	34	32	30	39	40	36	35	35	41	43	31	36	13	45	50	35	41	46	46	35	33	47	46	45	41	55	55	45
14	37	33	37	36	34	39	42	43	42	38	40	42	45	33	40	14	46	54	38	47	47	49	38	38	56	50	51	47	56	60	48
15	39	35	38	39	36	41	43	45	45	39	45	46	46	36	41	15	48	60	39	51	51	54	39	39	58	52	52	57	63	62	55
16	42	37	40	41	38	43	44	46	49	41	49	48	49	45	53	16	53	61	47	54	57	55	40	45	62	53	57	60	67	68	58
17	43	39	41	46	39	47	45	48	52	49	55	56	50	54	55	17	55	62	53	55	59	57	43	58	63	56	64	64	70	71	66
18	45	44	43	49	40	49	51	51	53	55	57	57	55	58	61	18	57	63	60	60	61	47	64	68	71	65	70	72	73	67	67
19	47	46	45	51	42	53	54	53	54	56	59	58	60	61	62	19	58	66	65	63	61	70	61	69	70	72	68	74	73	74	73
20	51	48	48	53	51	56	56	55	56	60	61	61	63	64	63	20	59	67	67	68	66	71	71	70	71	73	71	75	75	76	75

Appendix E (Ctd.)

Random Number Tables for the Selection of 20 Grade 6 Students within each Selected School

Case#	R81	R82	R83	R84	R85	R86	R87	R88	R89	R90	R91	R92	R93	R94	R95	Case#	R96	R97	R98	R99	R100
1	2	1	4	8	7	13	2	3	2	2	3	4	3	4	6	1	6	7	4	1	2
2	3	3	10	10	11	16	3	5	7	4	4	6	6	11	11	2	7	11	9	2	5
3	6	4	11	11	13	17	10	11	14	5	6	7	8	14	20	3	9	13	15	3	6
4	8	5	14	12	15	19	18	12	16	12	9	10	12	19	22	4	13	15	32	6	7
5	12	10	15	13	20	20	21	18	19	15	10	15	31	20	23	5	17	16	38	9	30
6	13	13	25	18	21	21	22	19	31	16	14	19	36	21	27	6	26	25	39	11	33
7	16	17	28	24	24	30	29	22	32	19	16	20	45	32	32	7	35	29	42	15	42
8	22	24	29	30	30	43	30	28	33	23	22	27	48	35	34	8	41	33	51	16	47
9	24	26	30	35	32	50	32	31	40	28	29	34	51	36	36	9	45	37	53	36	51
10	33	32	33	42	34	53	33	39	45	31	31	35	53	43	37	10	56	41	54	39	53
11	41	42	34	43	36	54	34	41	49	36	37	41	54	44	49	11	65	43	57	47	57
12	43	47	39	55	47	65	35	48	50	37	49	50	57	46	52	12	66	50	61	53	64
13	44	52	48	56	52	67	46	50	58	48	50	58	67	47	57	13	68	60	78	73	65
14	54	54	53	58	56	72	48	52	61	52	53	62	70	48	66	14	73	62	82	78	67
15	59	60	60	62	58	76	56	53	62	58	56	66	73	55	69	15	76	65	86	81	78
16	60	64	64	64	60	79	57	55	64	59	68	75	74	61	73	16	82	72	91	82	79
17	65	65	67	69	63	80	61	72	73	64	73	81	78	74	74	17	83	76	92	85	81
18	66	68	68	70	74	81	65	77	77	70	76	84	82	80	77	18	84	77	93	89	87
19	79	69	70	75	77	83	68	78	79	78	84	90	86	86	86	19	89	80	96	91	93
20	80	82	75	77	84	85	75	79	82	81	88	92	88	94	93	20	95	96	98	93	96

Case#	R101	R102	R103	R104	R105	R106	R107	R108	R109	R110	R111	R112	R113	R114	R115	Case#	R116	R117	R118	R119	R120	R121	R122	R123	R124	R125	R126	R127	R128	R129	R130
1	10	5	4	6	2	4	12	1	1	3	2	6	10	3	2	1	3	4	3	3	20	7	7	12	8	9	2	1	27	1	6
2	11	16	7	8	10	5	21	9	7	4	8	23	13	13	6	2	5	7	12	6	23	13	17	32	10	12	14	8	28	6	15
3	18	22	11	13	16	6	26	10	11	6	10	32	14	15	17	3	6	12	15	8	26	21	18	35	11	18	17	10	30	17	24
4	19	31	25	20	25	8	28	12	13	13	12	54	18	17	25	4	10	19	23	16	38	22	19	38	16	20	20	12	43	20	25
5	25	37	26	28	27	13	37	17	14	20	13	55	22	20	28	5	15	20	27	17	39	27	24	42	26	23	25	24	47	26	28
6	26	42	28	33	39	14	41	25	19	26	18	59	25	25	29	6	19	22	28	22	41	30	29	49	38	25	37	31	48	41	33
7	29	43	38	37	46	15	43	40	21	35	30	66	26	29	39	7	23	28	42	25	43	36	33	68	46	27	41	35	55	50	35
8	45	46	40	42	51	17	44	43	29	44	38	69	30	55	42	8	27	30	53	28	45	41	35	76	47	28	47	43	63	51	36
9	47	51	45	44	52	33	53	44	32	48	48	74	41	56	52	9	33	33	54	44	49	69	37	86	57	36	67	53	65	53	37
10	62	54	49	57	61	40	60	48	34	49	50	78	44	57	62	10	35	39	55	45	61	89	46	90	60	45	71	62	67	68	38
11	65	58	57	62	65	50	61	56	41	50	52	89	47	62	64	11	41	46	60	47	64	92	56	92	65	57	75	65	71	70	41
12	72	61	60	68	68	61	68	59	42	51	56	90	49	74	66	12	52	48	62	52	67	99	65	95	69	59	79	68	79	84	42
13	79	64	67	80	69	63	73	62	47	54	64	98	50	78	79	13	53	54	63	74	71	104	71	96	70	80	88	73	80	88	57
14	88	70	68	85	70	73	74	64	64	66	66	99	64	90	81	14	56	57	73	77	75	105	75	101	81	86	89	79	96	92	67
15	93	73	69	86	77	80	75	68	65	70	81	100	66	92	86	15	57	97	84	78	80	109	78	102	87	92	100	92	103	96	71
16	95	82	72	87	78	85	81	78	71	75	84	104	69	93	87	16	61	99	90	98	83	111	97	106	88	95	101	98	107	115	83
17	96	93	78	88	82	93	88	81	79	78	86	105	73	97	94	17	64	102	105	106	89	114	102	108	94	100	109	99	108	119	85
18	99	94	97	97	90	95	93	87	86	79	91	109	82	99	96	18	83	110	108	107	110	116	115	114	95	106	117	100	112	125	102
19	100	98	101	98	96	96	104	91	97	89	105	110	103	102	103	19	95	113	109	114	115	117	117	121	116	113	119	117	113	126	106
20	101	102	102	102	104	97	105	102	98	108	109	111	107	104	115	20	113	115	111	119	119	119	121	123	119	115	124	119	125	129	122

Appendix E (Ctd.)

Random Number Tables for the Selection of 20 Grade 6 Students within each Selected School

Case#	R131	R132	R133	R134	R135	R136	R137	R138	R139	R140	R141	R142	R143	R144	R145	Case#	R146	R147	R148	R149	R150	R151	R152	R153	R154	R155	R156	R157	R158	R159	R160
1	4	5	2	3	3	5	20	35	15	1	1	10	9	3	1	1	5	3	6	3	12	4	6	6	6	10	1	1	9	9	8
2	8	8	6	10	17	7	22	36	18	2	7	12	12	12	5	2	6	12	10	7	18	13	9	10	16	13	15	2	18	19	31
3	39	11	13	13	30	12	34	37	24	8	11	34	17	15	27	3	10	21	13	17	25	15	15	18	25	30	17	11	19	30	33
4	43	26	36	33	31	13	37	53	26	14	27	37	20	16	31	4	14	34	14	29	30	19	19	21	26	40	21	38	25	51	35
5	46	33	38	38	55	15	41	73	28	15	28	38	34	21	39	5	15	35	17	41	33	29	20	22	32	56	22	44	26	64	38
6	54	49	42	55	56	23	51	75	29	18	42	39	37	43	46	6	16	43	20	46	41	30	21	26	39	73	25	49	30	67	57
7	71	62	44	57	70	32	52	78	30	34	45	60	52	48	49	7	17	51	40	50	45	36	22	34	49	74	29	50	36	69	60
8	85	64	51	58	92	42	64	83	38	46	49	61	69	68	52	8	29	62	42	52	51	39	34	40	51	75	47	83	39	81	62
9	86	73	58	59	96	51	70	89	53	49	58	67	72	80	62	9	44	68	45	64	53	46	39	44	52	82	55	89	46	89	72
10	100	78	65	61	102	53	74	90	64	58	59	82	85	93	74	10	54	73	53	69	54	51	43	46	54	83	63	104	51	94	74
11	101	79	67	62	103	59	75	93	65	71	67	85	86	96	76	11	55	75	59	71	58	58	65	51	57	90	72	105	52	100	97
12	104	86	77	66	105	62	76	96	77	81	71	86	90	97	82	12	69	83	60	80	60	62	76	55	63	103	80	107	66	101	123
13	106	88	90	73	107	66	78	105	85	96	77	95	93	106	86	13	76	101	71	87	64	77	82	56	73	108	81	108	70	106	124
14	107	90	99	79	108	92	83	115	86	106	79	97	100	115	111	14	84	103	83	93	102	82	91	60	90	110	86	122	75	109	127
15	108	97	100	86	109	94	85	116	96	114	84	107	105	120	114	15	104	107	92	98	103	98	100	67	102	121	93	125	87	124	128
16	113	115	117	98	110	105	93	117	102	116	101	112	106	127	115	16	108	125	102	107	110	103	105	85	104	125	97	142	94	133	149
17	117	119	118	99	113	107	96	121	107	120	126	118	115	133	118	17	111	128	108	110	117	109	113	90	125	129	103	145	119	142	154
18	127	120	119	112	120	115	99	124	114	122	129	124	122	134	132	18	130	130	135	131	127	111	114	94	133	130	128	148	138	149	155
19	129	129	121	113	129	120	105	130	127	123	136	129	131	142	141	19	133	143	136	134	140	112	132	109	134	140	154	149	145	151	156
20	130	131	133	121	131	125	122	137	137	125	138	135	142	143	142	20	140	145	146	139	150	139	147	149	142	153	155	157	152	154	158

Case#	R161	R162	R163	R164	R165	R166	R167	R168	R169	R170	R171	R172	R173	R174	R175	Case#	R176	R177	R178	R179	R180	R181	R182	R183	R184	R185	R186	R187	R188	R189	R190
1	1	10	16	14	3	13	10	7	2	5	1	7	2	19	8	1	5	2	2	1	1	15	1	2	8	12	6	15	1	5	4
2	2	31	21	27	5	15	29	21	6	18	8	9	6	31	11	2	19	15	5	2	15	17	8	4	9	17	10	17	6	10	10
3	4	52	28	36	16	19	35	23	28	40	14	19	24	38	21	3	20	25	9	21	17	35	15	38	16	38	15	18	13	14	27
4	10	54	29	46	33	42	39	36	41	58	23	27	28	44	44	4	22	31	11	29	27	41	19	44	17	39	28	33	15	16	33
5	39	64	41	51	35	46	53	69	48	64	38	59	37	48	48	5	29	37	13	42	37	45	28	52	26	45	39	40	30	20	37
6	56	66	42	54	42	49	54	90	70	86	39	75	53	51	49	6	45	47	22	44	40	55	52	59	54	51	53	52	44	21	45
7	58	69	46	57	49	64	66	91	74	87	43	77	62	62	59	7	67	62	52	46	58	64	65	74	66	57	88	62	61	38	49
8	63	71	49	62	55	67	81	95	84	105	49	89	71	71	64	8	68	67	69	53	73	70	72	88	73	59	91	68	63	44	56
9	64	75	62	72	61	73	103	107	88	109	59	90	91	77	67	9	73	86	76	64	78	80	73	93	75	60	92	78	82	52	71
10	77	77	70	79	63	104	106	115	101	112	72	93	103	79	70	10	80	87	80	70	104	111	74	97	82	61	97	80	85	69	82
11	84	84	75	89	65	107	117	124	106	125	82	94	119	108	72	11	91	96	81	75	116	114	78	115	85	72	112	107	91	81	119
12	85	87	78	98	78	113	122	128	115	126	87	96	127	111	79	12	99	103	88	76	117	115	80	116	90	73	116	109	104	86	122
13	87	91	79	99	105	115	130	133	117	131	95	113	128	113	94	13	110	109	94	82	118	117	98	123	120	76	126	116	119	105	128
14	97	92	111	119	107	116	134	134	121	134	106	123	129	117	122	14	126	117	101	90	119	119	99	124	133	87	130	124	120	109	134
15	107	93	117	128	119	127	136	138	126	139	127	125	133	131	123	15	129	119	106	129	142	127	120	130	148	96	151	132	123	113	139
16	111	96	146	134	131	146	139	142	137	141	137	134	140	142	131	16	133	124	114	141	144	134	122	149	151	126	153	133	138	114	146
17	115	126	147	142	134	148	147	152	158	152	142	141	146	149	132	17	137	146	133	151	163	140	143	155	167	129	159	155	143	131	148
18	125	128	156	147	143	159	152	153	160	159	143	143	151	153	146	18	140	162	136	159	164	159	163	161	168	146	167	157	148	143	164
19	128	153	157	156	161	164	157	161	163	162	146	159	154	156	159	19	154	164	142	167	167	176	164	164	175	151	168	159	153	171	167
20	155	155	161	162	162	165	162	164	168	163	147	172	163	157	163	20	155	173	154	168	176	178	171	170	180	157	182	167	160	184	187

Appendix E (Ctd.)

Random Number Tables for the Selection of 20 Grade 6 Students within each Selected School

Case#	R191	R192	R193	R194	R195	R196	R197	R198	R199	R200	Case#	R201	R202	R203	R204	R205	R206	R207	R208	R209	R210	R211	R212	R213	R214	R215
1	12	5	9	11	21	2	4	4	7	4	1	7	1	7	16	4	11	5	9	8	2	17	1	6	1	5
2	22	10	12	14	22	6	14	8	9	16	2	17	16	8	30	40	15	23	10	15	16	19	26	11	8	9
3	24	13	30	17	35	12	40	27	13	38	3	21	28	21	63	47	37	38	12	19	20	25	40	14	31	25
4	45	15	42	25	39	13	53	28	32	41	4	56	29	22	72	55	41	43	21	29	39	34	42	25	39	31
5	49	23	46	32	45	18	54	41	64	43	5	62	38	31	75	96	46	58	34	69	50	41	65	36	45	32
6	55	26	56	35	54	25	78	49	66	54	6	66	44	32	76	105	49	67	41	72	67	44	69	37	52	38
7	59	35	70	37	75	42	84	77	88	56	7	78	58	44	88	120	50	70	45	84	92	62	73	42	54	39
8	60	52	73	67	79	44	85	80	117	61	8	80	70	57	89	123	52	79	84	90	104	67	75	47	60	55
9	76	57	78	70	100	58	106	89	119	68	9	106	96	59	94	124	70	81	110	95	106	73	110	70	65	58
10	109	84	88	71	109	61	111	94	130	94	10	122	98	71	126	138	73	118	120	114	114	87	113	91	73	60
11	116	86	90	72	111	65	113	95	133	96	11	124	102	78	135	142	94	121	125	117	118	113	114	94	75	71
12	120	105	92	74	113	98	122	104	139	100	12	125	121	86	139	143	121	126	129	118	135	132	158	99	90	79
13	123	123	102	83	115	111	142	105	144	105	13	126	123	87	147	149	139	131	133	124	137	143	159	133	96	92
14	148	126	104	105	132	116	172	111	146	124	14	132	124	90	153	152	142	151	138	148	142	148	163	139	107	93
15	149	132	113	117	144	133	181	151	151	130	15	150	155	146	160	153	151	165	139	149	148	153	164	141	129	107
16	150	140	118	123	154	134	182	154	170	150	16	163	163	147	173	163	155	166	150	152	156	159	177	182	173	115
17	162	152	130	128	156	160	185	166	172	151	17	166	172	164	179	164	166	178	160	155	159	165	187	199	174	118
18	169	154	152	130	162	168	194	175	174	169	18	170	182	172	184	165	179	179	191	176	185	168	191	201	186	160
19	170	160	153	135	167	173	195	196	177	172	19	192	185	178	190	171	201	185	201	198	190	200	208	202	189	210
20	184	166	173	156	173	174	196	198	182	198	20	194	190	180	193	198	204	189	202	199	203	206	211	206	198	213

Case#	R216	R217	R218	R219	R220	R221	R222	R223	R224	R225	R226	R227	R228	R229	R230	Case#	R231	R232	R233	R234	R235	R236	R237	R238	R239	R240	R241	R242	R243	R244	R245
1	10	21	14	1	2	1	10	1	5	1	10	35	2	6	3	1	22	3	14	19	4	43	21	2	1	15	24	4	4	24	12
2	12	31	31	7	5	12	18	3	13	12	14	40	5	12	7	2	24	7	35	31	22	46	24	8	5	36	27	8	67	28	30
3	16	37	32	8	11	13	20	4	35	19	47	70	36	49	24	3	36	23	39	44	28	48	55	31	11	49	30	16	77	38	61
4	20	48	34	12	15	25	24	18	41	29	66	77	44	60	28	4	38	65	55	58	38	55	56	35	42	76	42	30	85	49	62
5	23	71	37	22	68	51	25	37	46	32	71	78	55	78	33	5	54	103	66	62	39	62	66	40	45	79	61	41	109	52	74
6	43	79	46	86	75	54	29	54	54	50	78	79	56	85	75	6	72	106	98	65	46	65	79	45	49	84	79	44	110	56	77
7	51	102	54	87	83	60	31	57	55	70	102	137	57	100	88	7	77	107	112	79	58	66	88	56	68	88	93	45	116	57	89
8	53	109	65	91	94	86	72	77	64	101	108	138	65	110	121	8	94	143	115	80	61	75	89	59	70	120	96	46	122	67	91
9	72	125	69	108	98	98	75	81	81	126	111	139	79	114	126	9	95	144	121	82	77	86	93	63	79	126	101	49	129	70	96
10	87	127	79	122	108	103	82	101	120	135	120	152	82	121	131	10	137	153	126	87	79	87	112	64	116	141	112	96	133	107	101
11	120	147	92	124	124	139	104	115	126	152	125	166	83	123	136	11	149	154	133	89	99	101	117	87	118	143	124	156	138	163	102
12	124	158	104	152	132	158	116	122	141	164	132	172	92	126	137	12	170	155	137	92	103	107	134	99	143	159	171	162	139	177	104
13	140	163	116	157	147	175	118	128	155	167	135	173	109	144	139	13	177	175	141	151	127	145	135	105	145	165	173	163	160	185	114
14	142	164	119	164	150	184	122	144	156	173	142	176	126	151	143	14	180	179	151	159	133	170	145	122	186	172	174	174	163	188	128
15	146	170	135	169	159	185	131	152	159	179	147	179	152	162	148	15	185	180	160	181	168	190	155	143	200	201	184	178	170	191	150
16	169	185	137	178	160	186	143	182	171	187	171	184	166	163	182	16	186	184	174	184	182	196	183	178	207	206	197	191	197	207	190
17	171	188	139	180	168	188	148	196	183	210	189	196	173	177	201	17	201	195	180	189	191	199	202	187	208	208	201	209	199	209	196
18	176	199	145	205	171	193	167	199	193	213	203	200	179	178	209	18	209	208	210	213	203	222	210	204	213	218	223	220	200	221	198
19	186	203	159	206	197	217	174	207	205	214	218	214	203	217	218	19	217	216	217	218	217	227	211	225	221	222	229	229	219	232	235
20	199	214	165	219	209	219	210	216	216	225	219	219	205	224	221	20	228	223	228	233	230	230	236	229	228	240	241	241	228	243	240

Appendix F

The 148 Test Items (and their Sources) that were Used in the “Hypothetical Test” for Calibrating the Reading Test Items

Section	RUMM VarName	SPSS VarName	KEY	S2P	S2T	S1P	Zim91	IEA Pop1	IEA Pop2
Section A	I0001	RA01XXXX	2	pread01					
	I0002	RA02XXXX	2	pread02					
	I0003	RA03XXXX	3	pread03					
	I0004	RA04XXXX	1	pread04					
	I0005	RA05XXXX	2	pread05					
	I0006	RA06XXXX	1	pread06					
	I0007	RA07XXXX	2	pread07					
	I0008	RA08XXXX	2	pread08					
	I0009	RA09XXXX	2	pread09					
	I0010	RA10XXXX	3	pread10					
	I0011	RA11XXXX	2	pread11					
	I0012	RA12XXXX	2	pread12					
	I0013	RA13XXXX	4	pread13					
	I0014	RA14XXXX	4	pread14					
	I0015	RA22XXXX	3	pread22					
	I0016	RA23XXXX	3	pread23					
	I0017	RA24XXXX	1	pread24					
	I0018	RA25XXXX	1	pread25					
	I0019	RA26XXXX	4	pread26					
	I0020	RA27XXXX	2	pread27					
	I0021	RA28XXXX	2	pread28					
	I0022	RA33XXXX	2	pread33					
	I0023	RA34XXXX	1	pread34					
	I0024	RA35XXXX	1	pread35					
	I0025	RA36XXXX	2	pread36					
	I0026	RA37XXXX	2	pread37					
	I0027	RA38XXXX	2	pread38					
	I0028	RA39XXXX	2	pread39					
	I0029	RA40XXXX	1	pread40					
	I0030	RA41XXXX	1	pread41					
	I0031	RA42XXXX	4	pread42					
	I0032	RA43XXXX	1	pread43					
	I0033	RA44XXXX	1	pread44					
	I0034	RA45XXXX	3	pread45					
	I0035	RA46XXXX	1	pread46					
	I0036	RA58XXXX	1	pread58					
	I0037	RA59XXXX	2	pread59					
	I0038	RA61XXXX	2	pread61					
	I0039	RA62XXXX	2	pread62					
	I0040	RA63XXXX	4	pread63					
	I0041	RA64XXXX	1	pread64					
	I0042	RA70XXXX	1	pread70					
	I0043	RA71XXXX	4	pread71					
	I0044	RA72XXXX	2	pread72					

Section	RUMM VarName	SPSS VarName	KEY	S2P	S2T	S1P	Zim91	IEA Pop1	IEA Pop2
	I0045	RA73XXXX	4	pread73					
	I0046	RA74XXXX	3	pread74					
	I0047	RA75XXXX	3	pread75					
	I0048	RA76XXXX	2	pread76					
	I0049	RA80XXXX	4	pread80					yes
	I0050	RA81XXXX	2	pread81					yes
	I0051	RA82XXXX	4	pread82					yes
	I0052	RA83XXXX	4	pread83					yes
Section B	I0053	RA29XX20	4	pread29		porange1			
	I0054	RA30XX21	1	pread30		porange2			
	I0055	RA31XX22	3	pread31		porange3			
	I0056	RA32XX23	4	pread32		porange4			
	I0057	RA47XX08	4	pread47		pbird3	bird3	yes	
	I0058	RA48XX10	2	pread48		pbird5	bird5	yes	
	I0059	RA49XX06	3	pread49		pbird1	bird1	yes	
	I0060	RA54XX12	3	pread54		pisland2	island2	yes	
	I0061	RA55XX11	1	pread55		pisland1	island1	yes	
	I0062	RA56XX14	4	pread56		pisland4	island4	yes	
	I0063	RA57XX13	2	pread57		pisland3	island3	yes	
Section C	I0064	RA160304	2	pread16	tread03	ptembo4	tembo4		
	I0065	RA170405	2	pread17	tread04	ptembo5	tembo5		
	I0066	RA180524	1	pread18	tread05	pmaria1	maria1	yes	
	I0067	RA190625	2	pread19	tread06	pmaria2	maria2	yes	
	I0068	RA200726	4	pread20	tread07	pmaria3	maria3	yes	
	I0069	RA651456	1	pread65	tread14	ptree1	tree1	yes	
	I0070	RA661557	1	pread66	tread15	ptree2	tree2	yes	
	I0071	RA671658	1	pread67	tread16	ptree3	tree3	yes	
	I0072	RA691860	2	pread69	tread18	ptree5	tree5	yes	
Section D	I0073	RA1501XX	2	pread15	tread01				
	I0074	RA2108XX	3	pread21	tread08				
	I0075	RA5031XX	1	pread50	tread31				
	I0076	RA5132XX	3	pread51	tread32				
	I0077	RA5233XX	3	pread52	tread33				
	I0078	RA5334XX	1	pread53	tread34				
	I0079	RA6035XX	2	pread60	tread35			yes	
	I0080	RA6817XX	3	pread68	tread17				
	I0081	RA7741XX	4	pread77	tread41				
	I0082	RA7843XX	1	pread78	tread43				
	I0083	RA7944XX	2	pread79	tread44				
Section E	I0084	RAXX02XX	3		tread02				
	I0085	RAXX09XX	4		tread09				
	I0086	RAXX13XX	1		tread13				
	I0087	RAXX19XX	2		tread19				yes
	I0088	RAXX20XX	3		tread20				yes
	I0089	RAXX21XX	2		tread21				yes
	I0090	RAXX22XX	2		tread22				yes
	I0091	RAXX23XX	2		tread23				
	I0092	RAXX24XX	3		tread24				yes
	I0093	RAXX25XX	1		tread25				

Section	RUMM VarName	SPSS VarName	KEY	S2P	S2T	S1P	Zim91	IEA Pop1	IEA Pop2
	I0094	RAXX26XX	4		tread26				
	I0095	RAXX27XX	2		tread27				
	I0096	RAXX28XX	2		tread28				
	I0097	RAXX29XX	2		tread29				
	I0098	RAXX30XX	1		tread30				
	I0099	RAXX36XX	3		tread36			yes	
	I0100	RAXX37XX	2		tread37			yes	
	I0101	RAXX38XX	4		tread38				
	I0102	RAXX39XX	3		tread39				
	I0103	RAXX40XX	3		tread40				
	I0104	RAXX42XX	2		tread42				
	I0105	RAXX45XX	3		tread45				
	I0106	RAXX46XX	1		tread46				
	I0107	RAXX47XX	1		tread47				
	I0108	RAXX48XX	1		tread48				
	I0109	RAXX49XX	3		tread49				
Section F	I0110	RAXX1027	1		tread10	pquick1	quick1	yes	
	I0111	RAXX1128	4		tread11	pquick2	quick2	yes	
	I0112	RAXX1229	3		tread12	pquick3	quick3	yes	
Section G	I0113	RAXXXX01	4			ptembo1			
	I0114	RAXXXX02	3			ptembo2			
	I0115	RAXXXX03	4			ptembo3			
	I0116	RAXXXX07	3			pbird2		yes	
	I0117	RAXXXX09	3			pbird4		yes	
	I0118	RAXXXX15	4			pjoseph1	joseph1		
	I0119	RAXXXX16	4			pjoseph2	joseph2		
	I0120	RAXXXX17	1			pjoseph3	joseph3		
	I0121	RAXXXX18	2			pjoseph4	joseph4		
	I0122	RAXXXX19	4			pjoseph5			
	I0123	RAXXXX30	4			pempty1	bottles1	yes	
	I0124	RAXXXX31	3			pempty2	bottles2	yes	
	I0125	RAXXXX32	4			pempty3	bottles3	yes	
	I0126	RAXXXX33	1			pempty4	bottles4	yes	
	I0127	RAXXXX34	3			pcarrot1	carrots1		
	I0128	RAXXXX35	4			pcarrot2	carrots2		
	I0129	RAXXXX36	1			pcarrot3	carrots3		
	I0130	RAXXXX37	1			pcarrot4	carrots4		
	I0131	RAXXXX38	4			pcarrot5	carrots5		
	I0132	RAXXXX39	2			ptempra1	temper1		
	I0133	RAXXXX41	2			ptempra3	temper3		
	I0134	RAXXXX42	4			ptempra4	temper4		
	I0135	RAXXXX43	2			ptempra5	temper5		
	I0136	RAXXXX44	3			pmaize1			
	I0137	RAXXXX45	3			pmaize2			
	I0138	RAXXXX46	3			pmaize3			
	I0139	RAXXXX47	2			pmaize4			
	I0140	RAXXXX48	3			pmaize5			
	I0141	RAXXXX49	1			pmaize6			
	I0142	RAXXXX50	3			pgrandp1			

Section	RUMM VarName	SPSS VarName	KEY	S2P	S2T	S1P	Zim91	IEA Pop1	IEA Pop2
	I0143	RAXXXX51	4			pgrandp2			
	I0144	RAXXXX52	2			pgrandp3			
	I0145	RAXXXX53	3			pgrandp4			
	I0146	RAXXXX54	4			pgrandp5			
	I0147	RAXXXX55	3			pgrandp6			
	I0148	RAXXXX59	1			ptree4			

Appendix G

The 91 Test Items (and their Sources) that were Used in the “Hypothetical Test” for Calibrating the Mathematics Test Items

Section	RUMM VarName	SPSS VarName	KEY	S2P	S2T	TIMSS Pop1	TIMSS Pop2
Section A	I0001	MA01XX	2	pmath01			
	I0002	MA02XX	2	pmath02			
	I0003	MA03XX	3	pmath03			
	I0004	MA04XX	2	pmath04			
	I0005	MA05XX	2	pmath05			
	I0006	MA06XX	3	pmath06			
	I0007	MA07XX	4	pmath07			
	I0008	MA08XX	2	pmath08			
	I0009	MA09XX	2	pmath09			
	I0010	MA10XX	4	pmath10			
	I0011	MA11XX	1	pmath11			
	I0012	MA12XX	3	pmath12			
	I0013	MA13XX	2	pmath13			
	I0014	MA14XX	4	pmath14			
	I0015	MA15XX	3	pmath15			
	I0016	MA16XX	2	pmath16			
	I0017	MA17XX	2	pmath17			
	I0018	MA18XX	2	pmath18			
	I0019	MA19XX	1	pmath19			
	I0020	MA20XX	1	pmath20			
	I0021	MA21XX	2	pmath21			
	I0022	MA22XX	1	pmath22			
	I0023	MA23XX	3	pmath23			
	I0024	MA24XX	2	pmath24			
	I0025	MA25XX	2	pmath25			
	I0026	MA31XX	2	pmath31			
	I0027	MA34XX	3	pmath34			
	I0028	MA35XX	2	pmath35			
	I0029	MA36XX	2	pmath36			
	I0030	MA37XX	2	pmath37			
	I0031	MA38XX	1	pmath38			
	I0032	MA39XX	3	pmath39			
	I0033	MA40XX	2	pmath40			
	I0034	MA41XX	4	pmath41			
	I0035	MA42XX	1	pmath42			
	I0036	MA43XX	4	pmath43			
	I0037	MA45XX	3	pmath45			
	I0038	MA46XX	3	pmath46			
	I0039	MA47XX	2	pmath47			L-10
	I0040	MA48XX	2	pmath48			
	I0041	MA49XX	1	pmath49			
	I0042	MA50XX	2	pmath50			P-17
	I0043	MA51XX	3	pmath51			

Section	RUMM VarName	SPSS VarName	KEY	S2P	S2T	TIMSS Pop1	TIMSS Pop2
	I0044	MA52XX	3	pmath52			
	I0045	MA53XX	2	pmath53			
	I0046	MA54XX	3	pmath54			
	I0047	MA59XX	1	pmath59			
	I0048	MA60XX	2	pmath60			
	I0049	MA61XX	3	pmath61			
	I0050	MA62XX	1	pmath62			
Section B	I0051	MA2616	2	pmath26	tmath16		
	I0052	MA2701	4	pmath27	tmath01	I-3	
	I0053	MA2803	1	pmath28	tmath03	I-8	
	I0054	MA2905	3	pmath29	tmath05	K-6	
	I0055	MA3007	3	pmath30	tmath07	L-5	
	I0056	MA3212	3	pmath32	tmath12		
	I0057	MA3315	2	pmath33	tmath15		
	I0058	MA4411	2	pmath44	tmath11		
	I0059	MA5514	2	pmath55	tmath14		
	I0060	MA5602	4	pmath56	tmath02	I-7	
	I0061	MA5706	3	pmath57	tmath06	K-9	
	I0062	MA5833	1	pmath58	tmath33		
	I0063	MA6328	1	pmath63	tmath28		N-17
	I0064	MAXX04	2		tmath04	I-9	R-12
Section C	I0065	MAXX08	3		tmath08		
	I0066	MAXX09	4		tmath09		P-8
	I0067	MAXX10	4		tmath10		
	I0068	MAXX13	3		tmath13		
	I0069	MAXX17	3		tmath17		I-8
	I0070	MAXX18	4		tmath18		J-14
	I0071	MAXX19	2		tmath19		J-18
	I0072	MAXX20	2		tmath20		K-4
	I0073	MAXX21	2		tmath21		
	I0074	MAXX22	2		tmath22		K-6
	I0075	MAXX23	3		tmath23		L-11
	I0076	MAXX24	2		tmath24		K-8
	I0077	MAXX25	1		tmath25		L-14
	I0078	MAXX26	2		tmath26		L-17
	I0079	MAXX27	3		tmath27		M-6
	I0080	MAXX29	2		tmath29		Q-1
	I0081	MAXX30	2		tmath30		R-7
	I0082	MAXX31	4		tmath31		R-9
	I0083	MAXX32	3		tmath32		S-2
	I0084	MAXX34	3		tmath34		V-3
	I0085	MAXX35	3		tmath35		
	I0086	MAXX36	3		tmath36		
	I0087	MAXX37	3		tmath37		
	I0088	MAXX38	3		tmath38		
	I0089	MAXX39	2		tmath39		
	I0090	MAXX40	3		tmath40		
	I0091	MAXX41	3		tmath41		

Appendix H

Example Test Items for Each Level of Competence in Reading

Level 1: Pre Reading (Linked with Level 1 in the Test Blueprint)

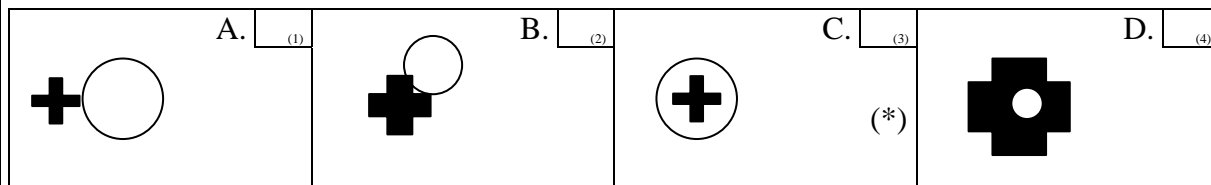
(a) Skills: Matches words and pictures involving concrete concepts and everyday objects.
Follows short simple written instructions.

(b) Example Test Items

- locate familiar words in a short (one line) text
- match words to pictures
- follow short and familiar instructions

In the questions on this page, choose the diagram that matches the word or sentences.

2. This cross is inside the circle.



Source: SACMEQ II Pupil Test.

Rasch Difficulty: -1.895

Comment: In this item the pupil needs to match the words “cross” and “circle” with the two items in each diagram – and then match the word “inside” with the diagram that illustrates the meaning of the word.

Appendix H (Ctd.)

Level 2: Emergent Reading (Linked with Level 2 in the Test Blueprint)

(a) Skills: Matches words and pictures involving prepositions and abstract concepts; uses cuing systems (by sounding out, using simple sentence structure, and familiar words) to interpret phrases by reading on.

(b) Example Test Items

- read familiar words and identify some new words
- use simple and familiar prepositions and verbs to interpret new words
- match words and very simple phrases

The Indian Tailor Bird

One of the most interesting birds I have seen is the Indian Tailor Bird. It is a small olive green bird that doesn't look at all unusual, yet it has a most unusual way of making its nest. The birds work together in pairs. First they find a leaf, the right size, and make holes along the edges with their beaks. Through these holes they thread grass. One bird pushes the thread from the outside, while the other bird sits in the nest and pushes it back until the edges of the leaf are sewn together to make a kind of bag, still hanging on the tree, in which the Tailor Bird lays its eggs.

50. What does the Tailor Bird use in place of thread?

- A. ☐₍₁₎ Grass (*)
- B. ☐₍₂₎ String
- C. ☐₍₃₎ Spider web
- D. ☐₍₄₎ Thorns

Source: SACMEQ II Pupil Test and SACMEQ II Teacher Test.

Rasch Difficulty: -1.634

Comment: In this item the words "thread" and "grass" are adjacent in both the question and in the text. The pupil needs to match a word in the question to a word in the text and then use the text immediately adjacent to it by reading on - but only within a very restricted range of text. The skill involved is essentially a word matching skill.

Appendix H (Ctd.)

Level 3: Basic Reading (Linked with Level 3 in the Test Blueprint)

(a) Skills: Interprets meaning (by matching words and phrases, completing a sentence, or matching adjacent words) in a short and simple text by reading on or reading back.

(b) Example Test Items

- use context and simple sentence structure to match words and short phrases
- use phrases within sentences as units of meaning
- locate adjacent words and information in a sentence

The Bird And The Elephant

A large tree grew in the middle of the jungle. At the top, a small bird had made a nest for her family of three baby birds. One day, an elephant came by. He leaned against the trunk, and scratched his back. The tree started to crack and sway. The baby birds, full of fear, huddled against their mother. She stuck the tip of her beak out of the nest, and said: "Hey, big animal, there are many trees around here! Why shake this one? My children are afraid, and could fall out of their nest."

The elephant said nothing, but he looked at the bird with his small eye, flapped his large ears in the wind, and left.

The next day, the elephant returned and scratched against the trunk once more. The tree began to sway. The frightened baby birds once again huddled against their mother's wings. Now Mother Bird was angry. "I order you to stop shaking our tree," she cried, "or I will teach you a lesson!"

"What could you do to a giant like me?" laughed the elephant. "If I wanted to, I could give such a push to this tree that your nest and your children would be flung far and wide."

The mother bird said nothing.

The next day, the elephant returned and scratched again. Quick as a flash, the mother bird flew into one of the elephant's enormous ears, and there, tickled the elephant by scratching him with her feet. The elephant shook his head ... nothing happened. So he begged the bird to leave and promised to stop scratching against the trunk.

The bird then left the elephant's ear and returned to her nest, beside her children. Never again did the elephant return to scratch his back.

45. Where exactly did the large tree grow?

- A. ☐ ₍₁₎ In the thick jungle
- B. ☐ ₍₂₎ In the forest
- C. ☐ ₍₃₎ In the middle of the jungle (*)
- D. ☐ In the garden

Source: SACMEQ II Pupil Test.

Rasch Difficulty: -1.049

Comment: This item is similar to those in the previous level - but in this instance the pupil needs to first match phrases, and then locate the adjacent phrase by reading on in the text.

Appendix H (Ctd.)

Level 4: Reading for Meaning (Linked with Level 4 in the Test Blueprint)

(a) Skills: Reads on or reads back in order to link and interpret information located in various parts of the text.

(b) Example Test Items

- interpret sentence and paragraph level texts
- match phrases across sentences
- read forwards and backwards in order to locate information in longer texts

Grandpa

Once upon a time, there was a very old man. His eyes had become weak. His ears were deaf, and his knees would shake. When he sat at the table, he was hardly able to hold the spoon. He spilled soup on the tablecloth, and he often slobbered.

He lived with his son and daughter-in-law. They also had a small boy who was four years old, so the old man was a grandfather.

His son and his son's wife found it disgusting to see him spilling food at the table. And so they finally ordered him to sit in a corner behind the stove. Here, they served him his food on a small earthenware plate. Now, Grandpa didn't even get enough to satisfy his hunger. He sat there feeling sad. He looked at the table, where the others were eating, and his eyes filled with tears.

Then, one day his shaking hands could not even hold the plate. It fell to the floor, and was broken into many pieces. The young wife scolded him. But the old grandfather said nothing. He just sighed. Then the young wife bought him a very cheap wooden bowl. Now he had to eat from that.

One day, while they were having dinner, the grandchild sat on the floor, and was very busy with some small pieces of wood.

"What are you doing?" asked his father.

"I am making a bowl," the boy answered.

"What is it for?"

"It is for my father and mother to eat from when I grow up."

The man and wife looked at each other for a long time. Then, they started crying. At once, they asked the old grandpa back to the table, and from then on he always ate with them. After that, even if he sometimes spilt his food, they never said a word about it.

54. How did grandfather feel when he sat by the stove?

- A. ☐ (1) Bored.
- B. ☐ (2) Tired.
- C. ☐ (3) Pleased.
- D. ☐ Unhappy (*)

Source: SACMEQ I Pupil Test

Rasch Difficulty: -0.544

Comment: In this item the pupil needs to be able to read on and read back once the key idea is located in the text. The pupil needs to read for meaning and then to link and interpret information from various parts of the text - not simply adjacent to the central idea of the task.

Appendix H (Ctd.)

Level 5: Interpretive Reading (Linked with Level 5 in the Test Blueprint)

(a) Skills: Reads on and reads back in order to combine and interpret information from various parts of the text in association with external information (based on recalled factual knowledge) that “completes” and contextualizes meaning.

(b) Example Test Items

- locate, interpret, and read forward to join two pieces of adjacent information
- use multiple pieces of information to interpret general purpose of a document
- paraphrase and interpret a single non-adjacent piece of information

Read the following passage and then answer the questions below.

What Is Quicksand?

Quicksand is a special kind of sand. Quicksand can swallow a pig, or a human, or an elephant.

Quicksand often looks like plain wet sand. But it is really soupy sand with so much water between the grains that you can't stand on it.

If you step onto quicksand, you will slowly sink up to your knees. If you thrash and squirm, you will sink deeper and deeper. But, if you lie flat on your back with your arms stretched out, you can float on the sand, as you can float in water.

Watch out for quicksand on sand bars, on the bottom of streams, or along sandy seacoasts.

You can test for quicksand by poking it with a long stick or pole. If the sand shakes and quakes, don't try to walk on it! It may be quicksand.

10. What is the main purpose of the passage?

- A. ☐ ₍₁₎ To tell people how to avoid the dangers of quicksand. (*)
- B. ☐ ₍₂₎ To encourage people to protect the beauty of nature.
- C. ☐ ₍₃₎ To describe how people and animals have been swallowed by quicksand.
- D. ☐ ₍₄₎ To explain how quicksand got its name.

Source: SACMEQ I Pupil Test and SACMEQ II Teacher Test.

Rasch Difficulty: 0.073

Comment: The pupils need to read on and read back in order to combine and interpret information from different parts of the text – and then use this to interpret the general purpose of the document.

Appendix H (Ctd.)

Level 6: Inferential Reading (Linked with Level 5 in the Test Blueprint)

(a) Skills: Reads on and reads back through longer texts (narrative, document or expository) in order to combine information from various parts of the text so as to infer the writer's purpose.

(b) Example Test Items

- interpret, and make inferences from, different types of texts by reading backwards and forwards to confirm links between widely separated information pieces
- extract information from a non-traditional (left to right) document
- make judgments about an author's intentions or purpose beyond the text content

Photography
Read the comic strip and then answer the questions below.

1 ALWAYS CHECK TO SEE THAT THERE IS A FILM IN THE CAMERA BEFORE YOU GO OUT.

2 MAKE SURE THE PERSON YOU ARE PHOTOGRAPHING IS IN THE CENTRE OF THE PICTURE AND IS AS LARGE AS POSSIBLE.

3 DO NOT TAKE A PHOTO WITH THE SUN SHINING STRAIGHT INTO THE CAMERA.

4 DO NOT GET TOO CLOSE TO THE PERSON YOU ARE PHOTOGRAPHING. IF YOU DO THE PICTURE WILL BE BLURRED.

5 TAKE THE LENS CAP OFF! ALWAYS CHECK TO SEE THAT THERE IS NOTHING IN THE WAY OF THE APERTURE.

6 PRESS THE SHUTTER RELEASE SLOWLY WHEN YOU ARE READY TO TAKE THE PICTURE. SHUTTER RELEASE.

72. Why should you take the lens cap off?

A. ☐ (1) To let a lot of light into the camera.

B. ☐ (2) So that it doesn't get in the way of the aperture. (*)

C. ☐ (3) To move the camera closer to you.

D. ☐ So the camera will be quiet.

Source: SACMEQ II Pupil Test.

Rasch Difficulty: 0.453

Comment: The pupil needs to examine and interpret information related to different pictures and words in a non-traditional (comic strip) instructional document, and then make a judgement about the purpose of a particular instruction made by the author.

Appendix H (Ctd.)

Level 7: Analytical Reading (Linked with Level 5 in the Test Blueprint)

(a) Skills: locates information in longer texts (narrative, document or expository) by reading on and reading back in order to combine information from various parts of the text so as to infer the writer's personal beliefs (value systems, prejudices, and/or biases).

(b) Example Test Items

- combine several pieces of information from a range of locations in complex and lexically dense text or documents
- analyse detailed text or extended documents for an underlying message
- identify meaning from different styles of writing

Vacancy

Read the following advertisement and then answer the questions below.

Vacancy - Job opportunity Post - Clerical Assistant

**A vacancy exists for the post of a clerical assistant
in a large farm located in Mbwewe.**

Qualifications:

The applicant,

- Should be a female of between 20 and 25 years of age;
- Must have successfully completed Primary 6;
- Should be fluent in either of the following languages: Kiswahili, English, or Portuguese;
- She must have a minimum work experience of three years in clerical duties.

Application should be sent to:

The General Manager
Mbwewe Farm
P.O. Box 70
Mbwewe

The deadline for application is 15 October 1999.

50. The job opportunity is for ...
- A. ☐ (1) a female clerk.
- B. ☐ (2) the general manager.
- C. ☐ (3) a large pineapple farm.
- D. ☐ (4) a clerical assistant. (*)

Source: SACMEQ II Teacher Test.

Rasch Difficulty: 1.348

Comment: In this item the pupil needs to read on and read back in order to combine information from various parts of a document, and then to decide upon the kind of person that the writer has in mind for the position.

Appendix H (Ctd.)

Level 8: Critical Reading (A New Level Generated from the Skills Audit)

(a) Skills: Locates information in a longer texts (narrative, document or expository) by reading on and reading back in order to combine information from various parts of the text so as to infer and evaluate what the writer has assumed about both the topic and the characteristics of the reader – such as age, knowledge, and personal beliefs (value systems, prejudices, and/or biases).

(b) Example Test Items

- use text structure and organisation to identify an author's assumptions and purposes
- identify an author's motives, biases, beliefs in order to understand the main theme
- link text to establish multiple meanings including analogy and allegory

Effective Thinking

Effective thinking, while starting with logic, goes further so as to include broad mental skills. It includes the understanding of complex and fluid situations, in dealing with which logical methods are inadequate as mental tools. Of course, thinking must never violate the rules of logic, but it may use techniques beyond those of exact mathematical reasoning. In the fields of social study and history, and in the problems of daily life, there are large areas where evidence is incomplete and may never be completed. Sometimes the evidence may also be untrustworthy; but if the situation is practical, a decision must be made. The scientist has been habituated to deal with properties which can be abstracted from their total background and with variables which are few and well defined. Consequently, where the facts are unique and unpredictable, where the variables are numerous and their interactions too complicated for precise calculation, the scientist is apt to throw up his hands in despair and perhaps turn the situation over to the sentimentalists or the mystics. But surely he would be wrong to ignore both this type of problem and this type of thinking; for the methods of logical thinking do not exhaust the resources of reason. In coping with complex and fluid situations we need thinking which is relational and which searches for cross bearings between areas; this is thinking in a context. By its use it is possible to reach an understanding of historical and social materials and of human relations, although not with the same degree of precision as in the case of simpler materials and recurring events. As Aristotle says, "It is the mark of an educated man to expect no more exactness than the subject permits."

46. The author believes scientists should widen their field of work by undertaking problems that are ...

- A. ☐₍₁₎ less specific and less precise. (*)
- B. ☐₍₂₎ more exact.
- C. ☐₍₃₎ more abstract.
- D. ☐₍₄₎ less complex and fluid.

Source: SACMEQ II Teacher Test

Rasch Difficulty: 3.372

Comment: In this task the pupil needs to read through the entire passage, to locate information relevant to scientists' thinking processes, and to distinguish this from alternative thinking styles. Then the pupil needs to identify the beliefs of the author by inference.

Appendix I

Example Test Items for Each Level of Competence in Mathematics

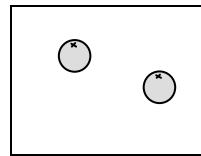
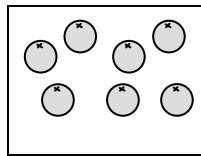
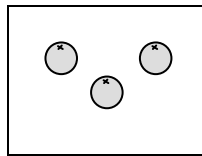
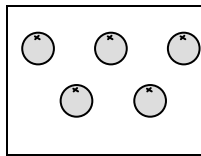
Level 1: Pre Numeracy (Linked with Level 1 in the Test Blueprint)

(a) Skills: Applies single step addition or subtraction operations. Recognizes simple shapes. Matches numbers and pictures. Counts in whole numbers.

(b) Example Test Items

- count illustrated objects
- recognise basic numbers and shapes
- carry out simple single operations of addition and subtraction

1. Which box has 7 oranges? Tick the correct box.



A. ☐ (1)

B. ☐ (2)

C. ☐ (3) (*)

D. ☐ (4)

3. $73 + 27 =$

A. ☐ (1) 46

B. ☐ (2) 90

C. ☐ (3) 100 (*)

D. ☐ (4) 110

Source: Both from SACMEQ II Pupil Test.

Rasch Difficulty: -4.584 and -2.717

Comment: In the first item the pupil needs to match the numeral with the picture representing the same number. This skill represents the ability to count and recognise numerical representations. In the second item the pupil needs to demonstrate the ability to perform a simple single arithmetic operation.

Appendix I (Ctd.)

Level 2: Emergent Numeracy (Linked with Level 1 in the Test Blueprint)

(a) Skills: Applies a two-step addition or subtraction operation involving carrying, checking (through very basic estimation), or conversion of pictures to numbers. Estimates the length of familiar objects. Recognizes common two-dimensional shapes.

(b) Example Test Items

- link simple verbal, graphic, and number forms with single arithmetic operations on whole numbers up to four digits
- recognise common shapes or figures in two dimensions
- estimate accurately lengths of simple shapes

4. Subtract ...

$$\begin{array}{r} 6,000 \\ - 2,369 \\ \hline \\ \hline \end{array}$$

- A. ☐ ₍₁₎ 3,531
- B. ☐ ₍₂₎ 3,631 (*)
- C. ☐ ₍₃₎ 3,742
- D. ☐ ₍₄₎ 4,369

Source: SACMEQ II Pupil Test and SACMEQ II Teacher Test.

Rasch Difficulty: -2.043

Comment: The pupil needs to perform the task of subtraction - with carrying.

Appendix I (Ctd.)

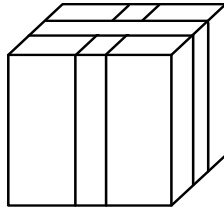
Level 3: Basic Numeracy (Linked with Level 2 in the Test Blueprint)

(a) Skills: Translates verbal information presented in a sentence, simple graph or table using one arithmetic operation in several repeated steps. Translates graphical information into fractions. Interprets place value of whole numbers up to thousands. Interprets simple common everyday units of measurement.

(b) Example Test Items

- recognise three-dimensional shapes and number units
- use a single arithmetic operation in two or more steps
- convert in single step units using division

40. What shape is this present?



- A. ☐ (1) sphere
- B. ☐ (2) cube (*)
- C. ☐ (3) cylinder
- D. ☐ (4) pyramid

Source: SACMEQ II Pupil Test.

Rasch Difficulty: -1.26

Comment: The pupil needs to know the names of 3 dimensional regular shaped objects, and then to be able to link them to everyday objects (for example, gifts).

Appendix I (Ctd.)

Level 4: Beginning Numeracy (Linked with Level 3 in the Test Blueprint)

(a) Skills: Translates verbal or graphic information into simple arithmetic problems. Uses multiple different arithmetic operations (in the correct order) on whole numbers, fractions, and/or decimals.

(b) Example Test Items

- convert units in two steps and count tabulated data
- analyse a visual prompt and interpret triangular shapes
- translate verbal to arithmetic form using two operations on fractions

11. A cake was shared among four pupils as follows: John gets $\frac{1}{2}$, Peter gets $\frac{1}{8}$, Sarah gets $\frac{1}{4}$ and Janet gets $\frac{1}{16}$. Who gets the largest share?

- A. ☐ ₍₁₎ John (*)
- B. ☐ ₍₂₎ Janet
- C. ☐ ₍₃₎ Sarah
- D. ☐ ₍₄₎ Peter

Source: SACMEQ II Pupil Test

Rasch Difficulty: -0.356

Comment: The pupil needs to translate the verbal description of a problem into an arithmetic problem – and then use several operations with fractions to obtain an answer.

Appendix I (Ctd.)

Level 5: Competent Numeracy (Linked with Level 3 in the Test Blueprint)

(a) Skills: Translates verbal, graphic, or tabular information into an arithmetic form in order to solve a given problem. Solves multiple-operation problems (using the correct order of arithmetic operations) involving everyday units of measurement and/or whole and mixed numbers. Converts basic measurement units from one level of measurement to another (for example, metres to centimetres).

(b) Example Test Items

- convert basic measurement units
- understand the order of magnitude of simple fractions
- conduct multiple steps with a range of basic operations in a strict sequence using an analysis of a short verbal or visual prompt

37. On a trip a bus driver keeps a record of how far he travels each day and the time taken. Here is the first part of his record. How far did the driver most likely travel on Day 3?

Day	Distance travelled (km)	Time taken (hours)
1	42	6
2	63	9
3		8
4	49	7

- A. ☐ (1) 23 km
- B. ☐ (2) 56 km (*)
- C. ☐ (3) 64 km
- D. ☐ (4) 84 km

Source: SACMEQ II Pupil Test and SACMEQ II Teacher Test.

Rasch Difficulty: -0.024

Comment: The pupil needs to translate tabular information into an arithmetic form and then solve the problem using multiple steps and multiple arithmetic operations in the correct sequence.

Appendix I (Ctd.)

Level 6: Mathematically Skilled (Linked with Level 4 in the Test Blueprint)

(a) Skills: Solves multiple-operation problems (using the correct order of arithmetic operations) involving fractions, ratios, and decimals. Translates verbal and graphic representation information into symbolic, algebraic, and equation form in order to solve a given mathematical problem. Checks and estimates answers using external knowledge (not provided within the problem).

(b) Example Test Items

- perform complex and detailed mathematical tasks (involving considerable abstraction of verbal, visual, and tabular information into symbolic forms and algebraic solutions) using knowledge not supplied with the task
- use of an extended verbal or graphic prompt (involving an analysis of steps) to identify the correct sequence of calculations
- convert, and operate on, units of measurement (time, distance, and weight)

The chart below shows some temperature readings made at different times on four days. Use the chart to answer questions 47 to 50.

	6 a.m.	9 a.m.	12 noon	3 p.m.	8 p.m.
Monday	15°C	17°C	20°C	21°C	19°C
Tuesday	15°C	15°C	15°C	10°C	9°C
Wednesday	8°C	10°C	14°C	13°C	15°C
Thursday	8°C	11°C	14°C	17°C	20°C

49. *What was the average temperature on Wednesday?*

- A. ₍₁₎ 12° C (*)
- B. ₍₂₎ 13° C
- C. ₍₃₎ 14° C
- D. ₍₄₎ 15° C

Source: SACMEQ II Pupil Test.

Rasch Difficulty: 0.710

Comment: The pupil needs to identify appropriate information expressed as temperatures in tabular form, and then to convert this into numbers, and then translate these into an arithmetic form in order to solve a problem.

Appendix I (Ctd.)

Level 7: Concrete Problem Solving (Linked with Level 5 in the Test Blueprint)

(a) Skills: Extracts and converts (for example, with respect to measurement units) information from tables, charts, visual and symbolic presentations in order to identify, and then solves multi-step problems.

(b) Example Test Items

- use multiple verbal order of steps with conversion of time units
- translate verbal to arithmetic form, apply units conversion with long division
- convert from mixed number fractions to decimals

24. The table shows the values of x and y , where x is proportional to y . What are the values of P and Q ?

x	3	6	P
y	7	Q	35

- A. ☐ ₍₁₎ $P=15$ and $Q=14$ (*)
- B. ☐ ₍₂₎ $P=14$ and $Q=31$
- C. ☐ ₍₃₎ $P=10$ and $Q=14$
- D. ☐ ₍₄₎ $P=14$ and $Q=15$

Source: SACMEQ II Teacher Test.

Rasch Difficulty: 1.573

Comment: The pupil needs to extract information from several places in a table of figures and then apply proportionate calculations in order to solve a multi-step problem involving fractions and conversions into whole numbers.

Appendix I (Ctd.)

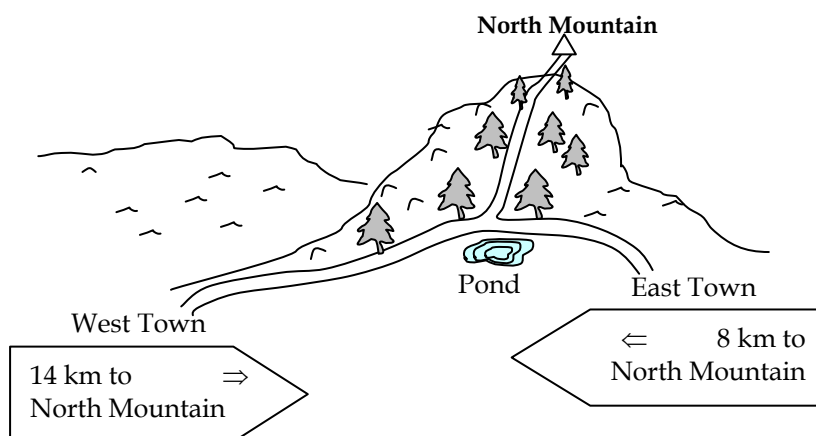
Level 8: Abstract Problem Solving (A New Level Generated from the Skills Audit)

(a) Skills: Identifies the nature of an unstated mathematical problem embedded within verbal or graphic information, and then translate this into symbolic, algebraic, or equation form in order to solve the problem.

(b) Example Test Items

- identify the nature of a problem, translate the information given into a mathematical approach, and then identify the correct mathematical strategies to obtain a solution a solution

35. There are two ways to go to North Mountain. One is from East Town and the other is from West Town. The distance from East Town to the pond in the map below is $\frac{1}{3}$ of the distance from West Town to the pond. What is the distance from West Town to the pond?



- A. ☐ (1) 7 km
B. ☐ (2) 8 km
C. ☐ (3) 9 km (*)
D. ☐ (4) 10 km

Source: SACMEQ II Teachers Test.

Rasch Difficulty: 1.934

Comment: The pupil needs to translate the information given into a form of mathematical thinking and then search for a solution strategy. The pupil needs to link the unknown distances to variables and then solve simultaneous equations. The key skills are the identification of the problem, its translation into a symbolic form, and the solution of the equations.