

Appendices

Appendix A (Analysis of 2007 Data from the Numeracy Development Projects: What Does the Picture Show?)

Composition of the Year 5–9 Cohort 2002–2007

Year	2002	2003	2004	2005	2006	2007	2002	2003	2004	2005	2006	2007
	Year 5						Year 6					
<i>Number of students</i>	11316	18665	9868	8353	5830	1405	11818	19338	9959	8689	6206	1293
Ethnicity												
NZ European	58	60	59	62	63	55	58	59	59	63	63	54
Māori	23	23	20	19	19	14	23	24	18	18	17	16
Pasifika	10	9	11	9	7	16	9	9	11	8	7	15
Asian	5	5	6	6	6	8	5	5	6	6	7	8
School Decile												
Low decile	35	34	29	22	19	24	34	34	30	21	18	28
Medium decile	38	38	39	39	36	26	39	39	37	39	36	27
High decile	27	28	32	39	45	50	27	28	33	40	47	46
	Year 7						Year 8					
<i>Number of students</i>	6418	13460	8374	6348	9515	4032	5802	11796	7306	5911	8853	3968
Ethnicity												
NZ European	56	53	59	65	66	59	58	54	58	64	66	59
Māori	26	28	25	22	19	18	26	27	25	21	19	16
Pasifika	9	10	10	6	7	11	9	11	10	7	6	11
Asian	5	5	4	4	4	7	5	4	3	4	4	8
School Decile												
Low decile	33	41	28	13	17	15	33	42	32	16	17	16
Medium decile	47	43	49	56	42	48	48	42	49	55	43	44
High decile	20	15	22	32	41	37	19	16	20	29	39	40
	Year 9											
<i>Number of students</i>				4068	6740	5900						
Ethnicity												
NZ European				66	62	62						
Māori				20	19	20						
Pasifika				5	10	6						
Asian				4	4	7						
School Decile												
Low decile				11	14	13						
Medium decile				52	61	53						
High decile				37	25	34						

Notes:

- For appendices A–I:
- totals may be affected by rounding
 - NZE = New Zealand European
 - percentages less than 0.5% are shown as 0%
 - where there is no data entered for students, the cell is left blank.

Appendix B (Analysis of 2007 Data from the Numeracy Development Projects: What Does the Picture Show?)

Percentages of Year 5–9 Students at Framework Stages on Each Domain (Initial and Final) in 2007

Year	5	6	7	8	9
<i>Number of students</i>	1415	1302	4049	3985	5900
Additive Domain					
Initial					
Total stages 0–4	42.4	29.4	23.9	18.8	12.1
0 Emergent					
1 1:1 Counting	0.6				
2 Count from 1 with Materials	1.8	1.5	0.7	0.5	
3 Count from 1 with Imaging	2.3	2.2	1.2	1.1	1.0
4 Advanced Counting	37.7	25.7	22.0	17.2	11.1
5 Early Additive Part–Whole	45.2	48.7	44.7	40.5	41.9
6 Advanced Additive Part–Whole	11.6	19.4	26.3	31.3	35.8
7 Advanced Multiplicative Part–Whole	0.7	2.2	4.9	8.9	9.8
Total stages 6–7	12.3	21.6	31.2	40.2	45.6
Final					
Total stages 0–4	21.7	14.1	10.5	6.9	4.6
0 Emergent					
1 1:1 Counting					
2 Count from 1 with Materials	0.8	0.8			
3 Count from 1 with Imaging	0.6	0.7			
4 Advanced Counting	20.3	13.3	9.8	6.9	4.6
5 Early Additive Part–Whole	50.0	38.9	33.0	27.4	27.7
6 Advanced Additive Part–Whole	24.2	36.9	41.3	38.1	42.4
7 Advanced Multiplicative Part–Whole	3.8	9.4	14.7	26.9	24.8
Total stages 6–7	28.0	46.3	56.0	65.0	67.2
Additive Gains					
Drop in counters	20.7	15.3	13.4	11.9	7.5
Rise in Advanced Additive Part–Whole thinkers	15.7	24.7	24.8	24.8	21.6
Multiplicative Domain					
Initial					
Total stages 0–4	56.2	37.7	29.9	21.8	13.2
n/a Not entered or applicable	8.7	8.4	2.0	1.5	0.3
2–3 Count from 1	10.2	5.8	4.9	4.1	2.7
4 Advanced Counting	37.3	23.5	23.0	16.2	10.2
5 Early Additive Part–Whole	26.8	34.2	30.0	27.7	26.8
6 Advanced Additive Part–Whole	13.7	21.5	26.4	30.4	35.7
7 Advanced Multiplicative Part–Whole	3.2	5.8	12.0	16.8	19.2
8 Advanced Proportional Part–Whole	0.1	0.8	1.6	3.3	5.1
Total stages 7–8	3.3	6.6	13.6	20.1	24.3
Final					
Total stages 0–4	30.0	14.9	12.1	8.3	5.9
n/a Not entered or applicable	3.5	0.0	0.7	0.7	0.1
2–3 Count from 1	2.7	1.3	1.7	1.1	0.8
4 Advanced Counting	23.8	13.6	9.7	6.5	5.0
5 Early Additive Part–Whole	31.8	26.3	23.1	17.2	15.5
6 Advanced Additive Part–Whole	26.3	35.0	34.2	32.4	35.3
7 Advanced Multiplicative Part–Whole	11.0	20.7	24.2	28.7	30.1
8 Advanced Proportional Part–Whole	0.9	3.1	6.5	13.4	13.3
Total stages 7–8	11.9	23.8	30.7	42.1	43.4
Multiplicative Gains					
Drop in counters	26.2	22.8	17.8	13.5	7.3
Rise in Advanced Multiplicative Part–Whole thinkers	8.6	17.2	17.1	22.0	19.1

Appendix B – continued

Percentages of Year 5–9 Students at Framework Stages on Each Domain (Initial and Final) in 2007

Year	5	6	7	8	9
<i>Number of students</i>	1415	1302	4049	3985	5900
Proportional Domain					
Initial					
Total stages 0–4	67.7	47.6	38.7	29.9	16.1
n/a Not entered or applicable	10.2	8.4	2.5	1.8	0.7
1 Unequal sharing	9.7	5.9	4.5	2.5	0.7
2–4 Equal sharing	47.8	33.3	31.7	25.6	14.7
5 Early Additive Part–Whole	20.5	30.8	28.8	25.2	29.8
6 Advanced Additive Part–Whole	8.2	16.2	18.6	21.8	18.0
7 Advanced Multiplicative Part–Whole	3.3	5.2	12.5	19.5	31.6
8 Advanced Proportional Part–Whole	0.1	0.2	1.4	3.6	4.4
Total stages 7–8	3.4	5.4	13.9	23.1	36.0
Final					
Total stages 0–4	36.6	21.7	17.6	12.7	7.4
n/a Not entered or applicable	5.3	5.8	1.3	1.6	0.3
1 Unequal sharing	0.8	1.1	0.7	0.4	0.2
2–4 Equal sharing	30.5	14.8	15.6	10.7	6.9
5 Early Additive Part–Whole	31.0	27.0	26.0	18.9	22.4
6 Advanced Additive Part–Whole	21.0	30.6	25.5	26.0	17.9
7 Advanced Multiplicative Part–Whole	10.5	18.8	25.6	30.8	40.0
8 Advanced Proportional Part–Whole	1.0	1.9	5.3	11.6	12.3
Total stages 7–8	11.5	20.7	30.9	42.4	52.3
Proportional Gains					
Drop in counters	31.1	25.9	21.1	17.2	8.7
Rise in Advanced Multiplicative Part–Whole thinkers	8.1	15.3	17.0	19.3	16.3
Fractions					
Initial					
n/a Not entered or applicable	8.6	5.6	2.2	2.4	2.9
2–3 Unit fractions not recognised	31.0	18.4	10.8	7.4	2.5
4 Unit fractions recognised	28.6	28.8	22.4	17.1	10.4
5 Ordered unit fractions	25.8	34.6	42.8	38.6	37.6
6 Co-ordinates numbers & denominators	4.4	9.9	13.3	18.5	23.2
7 Equivalent fractions	1.1	2.0	5.7	10.1	17.0
8 Ordered fractions	0.5	0.7	2.9	5.8	6.4
Total stages 7–8	1.6	2.7	8.6	15.9	23.4
Final					
n/a Not entered or applicable	3.6	3.0	1.2	1.9	5.5
2–3 Unit fractions not recognised	4.7	3.2	2.6	2.3	0.8
4 Unit fractions recognised	21.6	13.7	10.7	7.9	6.0
5 Ordered unit fractions	47.1	37.5	37.6	26.0	24.6
6 Co-ordinates numbers & denominators	14.8	25.5	24.1	24.2	21.9
7 Equivalent fractions	5.3	10.7	13.7	19.2	28.9
8 Ordered fractions	3.0	6.4	10.1	18.6	12.4
Total stages 7–8	8.3	17.1	23.8	37.8	41.3
Fraction Gains stages 7–8	6.7	14.4	15.2	21.9	17.9

Appendix B – continued*Percentages of Year 5–9 Students at Framework Stages on Each Domain (Initial and Final) in 2007*

Year	5	6	7	8	9
<i>Number of students</i>	1415	1302	4049	3985	5900
Place Value					
Initial					
Not entered	0.4	0.3	2.8	0.4	2.7
0–1 Emergent	0.6	0.4	0.2	0.3	0.1
2 One as a unit	4.3	2.5	0.8	0.6	0.2
3 Five as a unit	4.6	2.5	1.6	2.2	1.2
4 Ten as a counting unit	64.3	49.5	34.3	20.4	8.4
5 Tens in numbers to 1000	21.1	29.9	36.8	38.3	40.5
6 Tens, hundreds, thousands in whole numbers	4.0	12.1	16.2	23.9	26.2
7 Tenths in decimals/orders decimals	0.5	2.5	5.5	9.8	12.2
8 Decimal conversions	0.3	0.4	1.7	4.0	8.5
Total stages 7–8	0.8	2.9	7.2	13.8	20.7
Final					
Not entered	0.6	0.8	0.6	0.8	5.4
0–1 Emergent	0.2	0.4	0.1	0.1	0.1
2 One as a unit	1.1	0.7	0.4	0.4	0.1
3 Five as a unit	1.3	0.8	0.9	0.9	0.3
4 Ten as a counting unit	44.3	26.1	15.5	7.8	3.4
5 Tens in numbers to 1000	34.6	32.4	35.9	28.0	25.1
6 Tens, hundreds, thousands in whole numbers	11.7	25.0	26.2	28.0	26.2
7 Tenths in decimals/orders decimals	4.8	10.7	13.6	18.4	18.4
8 Decimal conversions	1.3	3.1	6.8	15.5	20.9
Total stages 7–8	6.1	13.8	20.4	33.9	39.3
Place Value Gains stages 7–8	0.5	10.9	13.2	20.1	18.6
Basic Facts					
Initial					
Not entered	0.1	0.3	0.5	0.4	2.7
0–1 Emergent	2.6	1.9	0.5	0.6	0.5
2 Addition facts to 5	8.1	3.5	2.4	1.3	0.5
3 Addition facts to 10	10.6	6.1	5.5	2.9	1.3
4 Addition with tens & doubles	32.5	21.4	16.0	10.9	4.4
5 Addition facts	28.1	32.0	30.9	24.7	18.4
6 Subtraction and multiplication facts	14.3	25.1	26.8	32.1	48.4
7 Division facts	3.4	9.1	15.2	22.2	22.4
8 Common factors & multiples	0.3	0.7	2.1	4.9	1.5
Total stages 7–8	3.7	9.8	17.3	27.1	23.9
Final					
Not entered	0.4	0.7	0.7	0.9	5.5
0–1 Emergent	0.4	0.4	0.2	0.2	0.1
2 Addition facts to 5	1.5	0.8	0.8	0.4	0.3
3 Addition facts to 10	3.6	2.5	1.9	1.1	0.4
4 Addition with tens & doubles	17.5	9.5	6.3	4.4	2.2
5 Addition facts	38.1	26.3	22.8	15.0	12.4
6 Subtraction and multiplication facts	22.8	29.7	29.6	25.3	37.8
7 Division facts	14.2	24.9	29.8	34.6	36.5
8 Common factors & multiples	1.5	5.2	7.9	18.2	4.9
Total stages 7–8	15.7	30.1	37.7	52.8	41.4
Basic Facts Gains stages 7–8	12.0	20.3	20.4	25.7	17.5

Appendix C (Analysis of 2007 Data from the Numeracy Development Projects: What Does the Picture Show?)

Percentages of Students at Framework Stages on Each Domain after NDP 2002–2007 (Final)

Year	2002	2003	2004	2005	2006	2007	2002	2003	2004	2005	2006	2007
	Year 5						Year 6					
<i>Number of students</i>	11316	18665	9868	8353	5830	1415	11818	19338	9959	8689	6206	1302
Additive Domain												
0–3 Count from 1	4	3	2	2	2	2	2	2	1	1	1	1
4 Advanced Counting	22	22	22	21	18	20	15	15	16	13	11	13
5 Early Additive P–W	50	52	52	51	46	50	46	47	46	45	39	39
6 Adv. Additive P–W	24	23	23	24	30	24	36	36	37	33	40	37
7 Adv. Multiplicative P–W				3	4	4				7	9	9
Total stages 6–7	24	23	23	27	34	28	36	36	37	41	49	46
Multiplicative Domain												
4 Advanced Counting	26	25	25	25	22	24	18	17	15	15	13	14
5 Early Additive P–W	31	30	30	30	32	32	28	27	26	25	26	26
6 Adv. Additive P–W	26	28	30	29	28	26	31	34	36	36	34	35
7 Adv. Multiplicative P–W	9	9	9	8	11	11	18	18	18	17	20	21
8 Adv. Proportional P–W				1	1	1				4	3	3
Total stages 7–8	9	9	9	9	12	12	18	18	18	20	23	24
Proportional Domain												
5 Early Additive P–W	29	29	35	35	33	31	27	27	33	30	29	27
6 Adv. Additive P–W	19	19	19	20	21	21	23	24	25	27	27	31
7 Adv. Multiplicative P–W	8	8	7	8	10	11	17	16	14	16	18	19
8 Adv. Proportional P–W	1	1	1	1	1	1	4	3	2	2	3	2
Total stages 7–8	9	9	8	9	11	12	20	19	17	18	21	21
Fractions												
6 Co-ordinates numbers & denominators	19	16	13	14	15	15	24	22	19	19	21	26
7 Equivalent fractions	3	3	4	4	5	5	7	7	8	8	9	11
8 Orders mixed fractions	2	2	2	2	2	3	5	5	5	5	5	6
Total stages 7–8	5	5	6	5	7	8	11	12	13	13	14	17

Note: Stage 7 on the Additive Domain and stage 8 on the Multiplicative Domain were introduced in 2005.

Appendix C – continued*Percentages of Students at Framework Stages on Each Domain after NDP 2002–2007 (Final)*

Year	2002	2003	2004	2005	2006	2007	2002	2003	2004	2005	2006	2007
	Year 7						Year 8					
<i>Number of students</i>	6418	13460	8374	6348	9515	4049	5802	11796	7306	5911	8853	3985
Additive Domain												
0–3 Count from 1	2	3	1	1	1	1	2	3	1	0	0	
4 Advanced Counting	14	15	14	11	9	10	10	10	8	8	6	7
5 Early Additive P–W	44	43	43	41	36	33	37	37	36	32	28	27
6 Adv. Additive P–W	40	39	41	36	39	41	51	50	55	40	40	38
7 Adv. Mult. P–W				11	16	15				19	25	27
Total stages 6–7	40	39	41	47	55	56	51	50	55	59	65	65
Multiplicative Domain												
4 Advanced Counting	15	14	12	12	10	10	11	10	7	8	6	7
5 Early Additive P–W	25	24	24	23	23	23	20	20	20	19	17	17
6 Adv. Additive P–W	32	35	38	38	34	34	32	34	37	35	34	32
7 Adv. Mult. P–W	24	21	22	20	23	24	34	32	34	25	29	29
8 Adv. Prop. P–W				6	7	6				11	12	13
Total stages 7–8	24	21	22	26	30	31	34	32	34	36	41	42
Proportional Domain												
5 Early Additive P–W	24	26	29	29	27	26	22	22	24	23	20	19
6 Adv. Additive P–W	25	25	27	28	26	26	24	26	29	28	27	26
7 Adv. Mult. P–W	19	17	18	21	24	26	23	21	23	27	31	31
8 Adv. Prop. P–W	7	5	4	4	6	5	14	11	9	8	11	12
Total stages 7–8	26	22	22	25	30	31	36	32	33	36	42	42
Fractions												
6 Co-ordinates numbers & denominators	26	23	20	20	23	24	28	24	23	22	23	24
7 Equivalent fractions	10	9	12	12	14	14	13	14	18	17	20	19
8 Orders mixed fractions	9	7	7	7	10	10	16	14	13	14	17	19
Total stages 7–8	19	17	19	19	24	24	29	28	30	31	36	38

Note: Stage 7 on the Additive Domain and stage 8 on the Multiplicative Domain were introduced in 2005.

Appendix D (Analysis of 2007 Data from the Numeracy Development Projects: What Does the Picture Show?)

Percentages of Year 5–9 Students at Framework Stages as a Function of School Decile (2007)

Stage Year	5	5	5	6	6	6	7	7	7	8	8	8	9	9	9
Decile	High	Mid	Low	High	Mid	Low	High	Mid	Low	High	Mid	Low	High	Mid	Low
Number	698	365	342	594	344	355	1483	1946	603	1585	1761	622	2001	3109	790
Additive Domain															
Initial															
Total 0–4	34	45	57	21	30	44	16	24	42	11	21	37	9	14	16
0 Em	0			0		1		0	0	0	1	0	0	0	0
1 Oto	1	1	0			1		0	1		0	1		0	
2 CM	2	2	2	0	2	3	1	1	2	0	0	2	0	0	
3 CI	1	3	4	1	4	3	0	1	4	0	1	4	1	1	1
4 AC	30	40	50	20	25	36	16	22	36	11	19	30	8	12	14
5 EA	51	43	36	52	51	41	42	46	46	40	41	42	39	43	46
6 AM	14	10	7	24	18	13	34	25	11	37	31	18	39	35	33
7 AP	1	1	0	3	2	2	8	4	1	12	8	4	13	9	6
Total 6–7	15	11	8	27	20	15	42	29	12	49	39	21	52	44	39
Final															
Total 0–4	15	22	35	8	14	27	6	11	22	4	8	16	3	5	9
0 Em	0			0		1			1	0		0		0	0
1 Oto	0	0	0					0	0			0			
2 CM	1	0	1		1	3	0	0	1	0	0	1		0	0
3 CI	0	1	0	0	0	0	0	0	3	0	0	1	0	1	1
4 AC	14	20	34	7	13	24	6	11	17	4	8	13	3	5	8
5 EA	49	52	49	35	40	44	27	36	38	21	29	41	24	29	31
6 AM	30	22	14	46	36	23	45	42	31	42	38	29	44	41	44
7 AP	5	4	1	12	10	5	22	11	10	34	25	15	29	25	16
Total 6–7	35	26	16	57	46	29	67	53	41	75	63	43	72	66	60
Additive Gains															
Drop in counters	19	23	21	14	16	17	11	13	20	7	12	22	6	9	7
Rise in Advanced Additive Part-Whole thinkers	20	15	8	30	27	14	25	23	29	26	25	22	21	22	22
Multiplicative Domain															
Initial															
Total 0–4	47	51	65	27	34	40	21	31	40	13	22	38	9	15	15
2–3 CO	9	12	16	5	5	10	4	5	9	3	3	11	2	3	3
4 AC	38	39	49	22	29	30	18	26	31	10	19	27	8	12	12
5 EA	31	35	20	38	38	35	28	31	37	26	29	31	23	27	35
6 AA	18	11	13	26	22	20	29	28	19	34	31	24	39	34	35
7 AM	5	2	2	8	5	5	19	10	4	21	17	7	23	19	13
8 AP	0	0		1	0	0	3	1	0	6	2	1	6	5	3
Total 7–8	5	3	2	9	5	5	21	11	4	27	19	8	29	24	15
Final															
Total 0–4	22	25	42	9	14	27	6	13	21	3	8	21	4	6	10
2–3 CO	2	2	5	1	1	3	1	1	5	0	1	4	1	1	2
4 AC	20	22	37	8	13	24	5	11	16	3	7	17	4	5	8
5 EA	30	37	34	24	27	30	20	24	31	12	19	27	11	17	23
6 AA	31	29	18	38	34	30	32	37	31	33	34	29	35	34	39
7 AM	16	8	5	24	23	13	31	22	16	34	28	19	35	30	21
8 AP	1	1	1	5	2	1	11	5	2	18	12	4	16	14	6
Total 7–8	17	9	6	29	25	14	42	26	18	52	40	24	50	43	28
Multiplicative Gains															
Drop in counters	24	27	24	18	20	13	15	18	20	10	14	17	5	9	5
Rise in Advanced Multiplicative Part-Whole thinkers	12	7	4	20	20	9	21	15	13	25	21	16	21	19	12

Appendix D – continued

Percentages of Year 5–9 Students at Framework Stages as a Function of School Decile (2007)

Stage Year	5	5	5	6	6	6	7	7	7	8	8	8	9	9	9
Decile	High	Mid	Low	High	Mid	Low	High	Mid	Low	High	Mid	Low	High	Mid	Low
<i>Number</i>	698	365	342	594	344	355	1483	1946	603	1585	1761	622	2001	3109	790
Proportional Domain															
Initial															
Total 0–4	58	70	73	37	46	50	30	39	51	22	28	48	11	18	17
1 US	9	12	13	4	9	9	3	4	9	2	2	6	0	1	1
2–4 ES	48	58	60	33	38	41	26	34	42	21	26	43	11	17	16
5 EA	28	17	19	35	31	33	28	30	33	22	28	30	25	32	37
6 AA	9	10	8	20	17	15	22	19	12	24	23	15	22	15	20
7 AM	6	2	1	8	4	3	19	11	3	27	18	6	37	31	24
8 AP		1	0	0	0		2	1	0	6	3	1	6	4	3
Total 7–8	6	3	1	9	5	3	21	13	4	33	21	6	43	35	27
Final															
Total 0–4	25	36	47	11	19	25	11	17	29	7	12	22	5	7	12
1 US	1	1	1	1	2	2	0	1	3	0	1	1	0	0	0
2–4 ES	25	35	46	10	18	23	10	17	26	7	11	20	5	7	12
5 EA	33	34	31	27	25	36	22	28	32	15	19	31	17	24	30
6 AA	24	20	20	34	33	30	24	27	28	25	28	25	18	18	18
7 AM	16	8	3	26	20	9	35	23	11	37	31	18	46	39	32
8 AP	1	1	0	3	2	0	9	4	1	16	10	4	15	12	8
Total 7–8	18	10	3	29	22	9	44	27	12	53	41	22	60	50	40
Multiplicative Gains															
Drop in counters	32	34	26	26	27	25	19	21	23	15	17	27	6	11	5
Rise in Advanced Multiplicative Part–Whole thinkers	12	7	2	20	18	7	23	15	9	21	20	16	18	16	14
Rise in Advanced Proportional Part–Whole thinkers	1	1	0	3	2	0	7	3	1	11	8	4	9	8	5
Fractions															
Initial															
2–3 NR	26	38	47	16	22	22	8	11	20	5	7	19	1	3	5
4 FR	32	33	28	27	32	35	17	25	32	11	20	28	7	12	18
5 OU	33	23	22	40	35	32	46	45	37	39	42	32	33	41	43
6 ND	6	4	2	12	9	9	17	12	9	23	17	15	27	22	23
7 EF	2	1	0	3	2	1	8	5	1	13	10	4	22	17	8
8 OF	1	0	0	1		0	5	2	1	9	5	2	11	5	3
Total 7–8	2	2	1	4	2	1	13	7	2	22	14	6	32	22	11
Final															
2–3 NR	3	6	7	1	3	8	1	3	7	1	2	10	0	1	3
4 FR	15	24	36	10	17	20	6	12	18	3	9	19	4	7	12
5 OU	51	51	43	36	43	40	33	40	44	22	30	28	18	29	35
6 ND	19	13	11	30	22	24	26	24	22	27	23	24	24	23	23
7 EF	8	3	3	14	11	7	20	12	7	22	20	13	34	31	22
8 OF	5	2	1	10	4	2	14	9	3	25	17	7	21	10	6
Total 7–8	12	5	3	24	15	9	34	21	10	47	37	20	55	40	27
Fractions Gains stages 7–8															
	10	4	3	20	13	8	21	13	8	25	23	13	23	18	16

Appendix D – continued

Percentages of Year 5–9 Students at Framework Stages as a Function of School Decile (2007)

Stage Year	5	5	5	6	6	6	7	7	7	8	8	8	9	9	9
Decile	High	Mid	Low	High	Mid	Low	High	Mid	Low	High	Mid	Low	High	Mid	Low
Number	698	365	342	594	344	355	1483	1946	603	1585	1761	622	2001	3109	790
Place Value															
Initial															
0–1 Em	0	1	1	0	0	1	0	0	0	0	0	2		0	1
2 OU	2	4	9	1	3	5	0	1	2	0	0	3	0	0	1
3 FU	2	7	7	1	4	3	1	2	4	1	1	9	1	1	2
4 TU	66	61	66	50	47	51	26	38	50	13	23	34	5	10	14
5 TT	23	22	15	32	28	28	42	36	33	41	38	33	32	46	51
6 TH	5	4	2	11	16	10	19	17	9	26	25	16	32	25	19
7 TD	1	0	0	3	2	2	8	5	1	13	10	3	18	11	7
8 DC	0	0	0	1			3	1	0	6	3	1	13	7	5
Total 7–8	1	1	1	4	2	2	12	6	2	19	13	3	31	17	13
Final															
0–1 Em	0		0	0	0	1		0	1			1		0	1
2 OU	1		3	0	1	2	0	0	1	0	0	2	0	0	1
3 FU	1	1	4		2	1	0	1	3	0	0	5	0	1	0
4 TU	40	43	56	23	23	36	10	17	26	4	8	18	2	4	7
5 TT	36	37	29	32	32	34	33	38	37	25	29	35	18	30	37
6 TH	13	16	5	26	28	21	27	27	24	28	32	20	24	30	30
7 TD	7	3	2	13	12	5	18	12	8	22	16	16	25	18	9
8 DC	2	1	1	6	2	0	11	5	2	21	15	4	32	17	15
Total 7–8	9	4	3	19	14	6	29	18	9	43	31	20	57	36	25
Place Value Gains stages 7–8															
	8	3	2	15	12	4	17	12	8	24	19	17	26	19	12
Basic Facts															
Initial															
0–1 Em	1	3	5	1	2	4	0	1	1	0	1	2	0	1	1
2 AF	7	13	7	3	4	4	2	2	4	1	1	2	0	1	1
3 AT	9	11	14	4	5	11	4	6	7	2	2	8	1	2	1
4 AD	32	36	30	18	24	24	13	16	25	7	11	21	3	5	6
5 AF	31	23	27	35	34	26	26	34	35	20	27	28	12	22	27
6 SM	16	13	13	25	27	23	30	26	24	33	33	29	47	51	54
7 DF	4	1	4	13	4	8	21	14	4	29	21	9	36	18	10
8 CF	0	1	0	1	0		4	1	0	8	4	2	2	1	1
Total 7–8	4	2	5	14	5	8	26	15	5	36	25	11	38	19	11
Final															
0–1 Em	0	0	1	0		1	0	0	1		0	1		0	1
2 AF	1	3	1	1	0	2	0	1	2	0	0	2	0	0	0
3 AT	3	4	5	2	3	4	1	2	4	0	1	4	0	1	1
4 AD	14	23	19	6	11	14	4	7	11	2	5	11	1	3	4
5 AF	36	41	40	23	33	26	18	25	29	11	16	24	7	16	20
6 SM	25	16	27	29	29	34	28	31	31	21	28	29	36	40	54
7 DF	18	13	8	32	21	19	36	29	19	41	35	20	49	37	19
8 CF	2	1	1	8	4	2	12	6	3	25	15	9	7	5	3
Total 7–8	21	13	9	40	25	20	48	35	22	66	50	29	56	41	22
Basic Facts Gains stages 7–8															
	16	12	4	26	20	12	23	20	17	30	25	19	18	22	11

Appendix E (Analysis of 2007 Data from the Numeracy Development Projects: What Does the Picture Show?)

Percentages of Year 5–9 Students at Framework Stages as a Function of Ethnicity (2007)

Stage Year	5			6			7			8			9		
	NZE	Māori	Pasifika	NZE	Māori	Pasifika	NZE	Māori	Pasifika	NZE	Māori	Pasifika	NZE	Māori	Pasifika
<i>Number</i>	777	197	230	705	202	201	2367	710	430	2365	628	432	3637	1155	369
Additive Domain															
Initial															
Total 0–4	37	50	61	25	30	49	19	32	46	15	26	40	11	15	23
0 Em	0			0	1		0			0	1		0		
1 Oto	1	1		0			0	0	0	0	0	1	0	0	0
2 CM	2	3	1	1	3	3	0	1	2	0	1	2	0	0	
3 CI	1	4	6	2	3	3	1	1	3	0	2	5	1	1	2
4 AC	33	43	54	22	23	43	18	29	41	14	22	33	10	14	21
5 EA	50	43	33	52	50	39	44	48	42	39	45	42	39	46	50
6 AM	13	7	6	21	20	10	31	19	11	36	24	15	39	34	24
7 AP	1			2	1	2	6	2	1	10	5	3	11	5	2
Total 6–7	14	7	6	23	20	12	37	21	12	46	30	18	50	39	27
Final															
Total 0–4	17	24	41	11	19	27	8	14	22	6	12	15	5	7	10
0 Em	0			0	1		0			0			0		
1 Oto	0	1	0				0	0		0	0				
2 CM	1	1	0	1	2	1	0	0	1	0	0	1	0	0	
3 CI	1	1	0	0			0	1	3	0	1	1	0	0	1
4 AC	16	21	40	9	16	26	8	12	19	6	11	12	4	6	9
5 EA	51	58	47	37	41	52	31	40	38	24	35	42	25	33	40
6 AM	28	17	12	43	36	17	46	38	30	41	36	28	43	46	36
7 AP	4	1		10	5	4	15	8	10	29	17	15	28	15	15
Total 6–7	32	18	12	53	40	21	61	46	40	71	53	43	71	61	50
Additive Gains															
<i>Drop in counters</i>	19	26	21	15	11	22	11	18	24	9	14	26	7	8	14
<i>Rise in Advanced Additive Part-Whole thinkers</i>	18	11	6	30	20	9	24	25	28	25	24	26	21	22	24
Multiplicative Domain															
Initial															
Total 0–4	46	62	70	27	41	45	24	38	45	16	29	41	11	17	19
2–3 CO	9	13	18	4	9	10	4	5	12	2	7	13	2	3	5
4 AC	37	49	52	23	32	36	20	33	33	14	22	28	9	14	14
5 EA	33	26	21	37	37	38	30	32	33	27	33	31	25	32	38
6 AA	17	12	8	27	20	13	30	23	18	34	26	23	36	37	30
7 AM	4	1	1	7	3	4	15	6	3	19	11	5	22	12	12
8 AP	0			1			2	0	1	4	1		6	3	1
Total 7–8	4	1	1	8	3	4	17	6	4	23	13	5	28	14	13
Final															
Total 0–4	21	37	46	12	19	24	9	16	19	5	13	20	5	8	7
2–3 CO	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
4 AC	19	32	43	11	17	22	8	14	15	4	12	15	4	7	6
5 EA	34	34	36	24	30	38	22	28	32	15	23	27	13	22	29
6 AA	31	23	14	35	33	29	35	35	30	34	32	32	34	41	38
7 AM	13	7	4	24	18	9	27	18	16	31	26	16	33	22	22
8 AP	1			5	1		7	3	3	15	6	4	15	8	5
Total 7–8	15	7	4	28	19	9	34	21	19	46	32	21	48	29	26
Multiplicative Gains															
<i>Drop in counters</i>	24	25	24	15	22	21	15	22	26	12	16	21	6	9	12
<i>Rise in Advanced Multiplicative Part-Whole thinkers</i>	10	6	3	20	16	5	17	14	15	23	19	15	20	15	13

Appendix E – continued

Percentages of Year 5–9 Students at Framework Stages as a Function of Ethnicity (2007)

Stage Year	5	5	5	6	6	6	7	7	7	8	8	8	9	9	9
	NZE	Māori	Pasifika	NZE	Māori	Pasifika	NZE	Māori	Pasifika	NZE	Māori	Pasifika	NZE	Māori	Pasifika
<i>Number</i>	777	197	230	705	202	201	2367	710	430	2365	628	432	3637	1155	369
Proportional Domain															
Initial															
Total 0–4	58	74	78	37	52	56	32	47	57	23	38	54	13	18	32
1 US	9	14	14	5	11	9	3	7	9	1	4	8	0	1	4
2–4 ES	50	60	64	32	42	47	29	40	47	22	34	47	13	17	28
5 EA	26	19	17	36	32	28	29	33	29	25	32	28	27	40	36
6 AA	11	7	5	19	13	14	21	14	11	24	18	14	18	17	13
7 AM	5	1		7	3	2	16	6	3	24	11	4	36	23	18
8 AP	0			1			2	0	1	4	2	1	5	2	2
Total 7–8	5	1	0	8	3	2	18	6	4	28	13	4	41	25	19
Final															
Total 0–4	28	42	50	13	25	28	13	24	28	9	18	20	6	10	15
1 US	1	1	1	1	2	2	0	1	2	0	1	1	0	0	1
2–4 ES	27	42	48	13	23	26	13	22	26	9	17	19	6	10	14
5 EA	33	34	33	25	34	36	25	33	34	16	26	32	19	33	34
6 AA	24	18	16	32	28	32	26	25	26	26	28	28	17	19	22
7 AM	14	6	1	27	12	4	31	17	11	36	24	16	45	31	23
8 AP	1			2	1	1	6	2	1	13	4	4	14	7	5
Total 7–8	15	6	1	29	13	4	36	18	12	49	28	20	58	39	29
Multiplicative Gains															
Drop in counters	31	32	28	24	27	28	19	23	29	14	19	34	7	8	17
Rise in Advanced Multiplicative Part–Whole thinkers	10	5	1	22	10	2	19	12	9	21	15	16	17	13	10
Rise in Advanced Proportional Part–Whole thinkers	1	0	0	2	1	1	4	2	1	9	2	3	9	5	4
Fractions															
Initial															
2–3 NR	28	44	51	16	28	23	7	18	21	5	12	22	2	4	8
4 FR	33	33	27	29	34	37	20	30	33	14	27	30	8	19	18
5 OU	32	19	21	40	31	30	47	42	34	44	37	33	38	42	42
6 ND	6	3	1	12	6	8	15	8	8	20	16	9	24	22	23
7 EF	2			2		1	7	2	3	12	5	5	20	11	9
8 OF	0					1	3	1	1	6	3	1	7	3	1
Total 7–8	2	0	0	2	0	2	10	2	4	18	8	6	28	14	10
Final															
2–3 NR	4	12	5	2	5	8	2	5	7	1	4	10	1	2	2
4 FR	17	28	39	12	19	22	9	16	19	5	14	20	4	12	11
5 OU	51	43	46	38	41	42	38	46	38	26	33	28	24	35	32
6 ND	18	12	8	27	23	24	25	22	24	25	22	24	24	22	24
7 EF	6	4	2	12	9	4	16	8	8	22	16	12	33	25	24
8 OF	4	1		9	3	1	11	4	5	22	10	6	14	6	7
Total 7–8	10	4	2	21	12	4	27	12	13	43	26	17	47	31	31
Fractions Gains stages 7–8															
	8	4	2	19	12	3	17	10	9	25	19	11	19	17	21

Appendix E – continued

Percentages of Year 5–9 Students at Framework Stages as a Function of Ethnicity (2007)

Stage Year	5			6			7			8			9		
	NZE	Māori	Pasifika	NZE	Māori	Pasifika	NZE	Māori	Pasifika	NZE	Māori	Pasifika	NZE	Māori	Pasifika
<i>Number</i>	777	197	230	705	202	201	2367	710	430	2365	628	432	3637	1155	369
Place Value															
Initial															
0–1 Em	1	1	0	0	2		0	0	0	0	1	1	0	0	1
2 OU	3	8	6	2	4	4	1	1	2	0	1	3	0	0	1
3 FU	3	6	10	2	2	5	1	2	5	1	2	9	1	1	5
4 TU	65	69	67	48	52	55	31	47	50	16	32	36	7	14	12
5 TT	24	13	16	32	30	26	39	38	30	40	38	34	38	53	53
6 TH	5	3	2	12	9	9	20	10	0	26	20	15	29	22	22
7 TD	1			3	2	2	7	2	3	12	5	3	15	7	5
8 DC	0			1			2	1	0	4	2		10	3	2
Total 7–8	1	0	0	3	2	2	9	2	3	17	6	3	25	10	7
Final															
0–1 Em	0			0	2		0	0		0	0		0	0	
2 OU	1	3	2	1	1	1	0	0	1	0	0	2	0		1
3 FU	1	2	4	0	3	2	0	1	3	0	1	5	0	0	2
4 TU	39	55	58	23	28	38	12	23	26	6	14	17	3	6	6
5 TT	39	28	31	33	32	37	35	43	34	25	35	38	23	38	40
6 TH	13	11	4	26	30	15	28	23	24	30	29	19	27	30	31
7 TD	7	2	2	13	5	8	16	8	9	21	13	15	21	14	12
8 DC	2			5	1		8	2	3	18	8	4	26	10	8
Total 7–8	8	2	2	17	6	8	23	10	12	38	21	19	47	25	20
Place Value Gains stages 7–8															
	7	2	2	14	4	6	15	8	9	22	15	16	22	15	13
Basic Facts															
Initial															
0–1 Em	2	6	4	2	4	2	1	1	1	0	1	1	0	1	2
2 AF	9	7	6	4	3	3	2	3	5	1	2	3	1	1	
3 AT	9	13	16	4	9	12	4	7	11	2	5	8	1	1	3
4 AD	32	38	35	21	27	27	14	20	23	9	14	23	4	7	6
5 AF	30	23	25	36	24	27	32	36	29	24	29	28	17	26	26
6 SM	15	12	12	24	25	24	28	23	23	33	34	27	50	52	49
7 DF	3	2	2	8	8	6	17	9	8	26	14	10	26	13	13
8 CF	0		0	1			2	0		5	2	2	2	1	1
Total 7–8	3	2	2	9	8	6	19	10	8	31	16	11	27	13	14
Final															
0–1 Em	0	1	1	0	1		0		1	0	0	0		0	1
2 AF	2	2	0	1	1	1	1	1	2	0	1	1	0	0	1
3 AT	3	7	4	2	3	4	2	2	4	1	2	4	0	1	1
4 AD	16	25	21	10	9	14	5	7	14	3	5	11	2	3	4
5 AF	40	38	41	27	29	31	22	32	26	13	21	25	12	20	14
6 SM	23	18	28	28	31	37	32	29	28	24	30	28	38	48	49
7 DF	14	9	5	26	26	12	31	27	22	39	30	23	42	26	30
8 CF	2		0	6	2	2	8	3	5	19	11	8	6	2	1
Total 7–8	16	9	5	32	27	14	39	30	26	58	41	31	47	28	31
Basic Facts Gains stages 7–8															
	13	7	3	22	20	8	20	20	19	28	25	20	20	15	17

Appendix F (Analysis of 2007 Data from the Numeracy Development Projects: What Does the Picture Show?)

Percentages of Students at Each Framework Stage Aligned with Ministry of Education Curriculum Expectations 2007

Stage	0:N/A	1	2	3	4	5	6	7	8	Not OK
Year 5 (The curriculum expectation at the end of year 5 is that the majority of students will be at stages 5 or 6.)										
Additive Domain										
Overall			1	1	20	50	24	4		22
High decile			1		14	49	30	5		15
Low decile			1		34	49	14	1		35
Multiplicative Domain										
Overall				3	25	33	27	11	1	28
High decile				2	20	30	31	16	1	22
Low decile				5	37	34	18	5	1	42
Proportional Domain										
Overall		1		32	33	22	11	1		33
High decile		1		25	33	24	16	1		26
Low decile		1		46	31	20	3			47
Stage	0	1	2	3	4	5	6	7	8	
<i>Longitudinal Study 2006</i>				1%	12%	31%	37%	17%	2%	13%
	AR				CFC	AAE		HA		

Year 6 (The curriculum expectation at the end of year 6 is that the majority of students will be at stage 6.)

Additive Domain										
Overall			1		13	39	37	10		53
High decile					7	35	46	12		42
Low decile	1		3		24	44	23	5		72
Multiplicative Domain										
Overall				1	14	26	35	21	3	41
High decile				1	8	24	38	24	5	33
Low decile				3	24	30	30	13	1	57
Proportional Domain										
Overall		1		16		29	33	20	2	46
High decile		1		10		27	34	26	3	38
Low decile		2		23		36	30	9		61
Stage	0	1	2	3	4	5	6	7	8	
<i>Longitudinal Study 2006</i>					6%	22%	34%	30%	6%	28%
	AR				CFC	AAE		HA		

Notes:

- AR = At Risk, CFC = Cause for Concern, AAE = Achieving At or Above Expectations, HA = High Achiever
- "Not OK" means categorised as "cause for concern" or "at risk".

Appendix F – continued

Percentages of Students at Each Framework Stage Aligned with Ministry of Education Curriculum Expectations 2007

Stage	0:N/A	1	2	3	4	5	6	7	8 Not OK	
Year 7 (The curriculum expectation at the end of year 7 is that the majority of students will be at stages 6 or 7.)										
Additive Domain										
Overall				1	10	33	41	15	44	
High decile					6	27	45	22	33	
Low decile	1		1	3	17	38	31	10	60	
Multiplicative Domain										
Overall				2	10	23	34	24	7 35	
High decile				1	5	20	32	31	11 26	
Low decile				5	16	31	31	16	2 52	
Proportional Domain										
Overall		1		16		26	26	26	5 43	
High decile				10		22	24	35	9 32	
Low decile		3		26		32	28	11	1 61	
Stage	0	1	2	3	4	5	6	7	8	
<i>Longitudinal Study 2006</i>					5%	21%	44%	24%	6%	26%
	AR					CFC	AAE		HA	

Year 8 (The curriculum expectation at the end of year 8 is that the majority of students will be at stage 7.)

Additive Domain

Overall					7	28	38	27	73
High decile					4	21	42	34	67
Low decile			1	1	13	41	29	15	85

Multiplicative Domain

Overall				1	7	17	33	29	13 58
High decile					3	12	33	34	18 48
Low decile				4	17	27	29	19	4 77

Proportional Domain

Overall				11		19	26	31	12 56
High decile				7		15	25	37	16 47
Low decile		1		20		31	25	18	4 77

Stage	0	1	2	3	4	5	6	7	8	
<i>Longitudinal Study 2006</i>					2%	12%	32%	33%	20%	46%
	AR					CFC	AAE			

Appendix F – continued

Percentages of Students at Each Framework Stage Aligned with Ministry of Education Curriculum Expectations 2007

Stage	0:N/A	1	2	3	4	5	6	7	8 Not OK	
Year 9 (The curriculum expectation at the end of year 9 is that the majority of students will be at stages 7 or 8.)										
Additive Domain										
Overall					5	28	42	25	75	
High decile					3	24	44	29	71	
Low decile				1	8	31	44	16	84	
Multiplicative Domain										
Overall				1	5	16	35	30	57	
High decile				1	4	11	35	35	51	
Low decile				2	8	23	39	21	72	
Proportional Domain										
Overall				7		23	18	41	48	
High decile				5		17	18	46	40	
Low decile				12		30	18	32	60	
Stage	0	1	2	3	4	5	6	7	8	
<i>Longitudinal Study 2006</i>					2%	14%	27%	39%	18%	43%
	AR						CFC	AAE		

Appendix G (Analysis of 2007 Data from the Numeracy Development Projects: What Does the Picture Show?)

Percentages on All Domains of Students at Stages 4–6 on Each of the Three Strategy Domains

Stage	Additive Domain				Multiplicative Domain				Proportional Domain			
	4	5	6	7	4	5	6	7–8	2–4	5	6	7–8
	AC	EA	AA	AM	AC	EA	AA	AM/AP	ES	EA	AA	AM/AP
<i>Number of students</i>	1401	5277	4652	3311	1233	3309	5559	5944	2091	3918	3821	6456
Additive Domain												
4 Advanced Counting	100				46	13	2		35	10	3	
5 Early Additive		100			48	65	37	5	52	58	35	7
6 Advanced Additive			100		4	21	54	46	11	30	53	48
7 Advanced Multiplicative				100		1	6	49		1	9	45
Total stages 6–7	0	0	100	100	4	22	61	95	11	31	62	92
Multiplicative Domain												
4 Advanced Counting	47	13	1		100				40	12	2	
5 Early Additive	40	41	11	1		100			36	44	16	3
6 Advanced Additive	9	39	46	11			100		14	38	58	24
7 Advanced Multiplicative	1	5	38	48				73	2	6	24	48
8 Advanced Proportional			4	41				27			2	24
Total stages 6–8	10	44	88	99	0	0	100	100	15	44	83	97
Proportional Domain												
2–4 Equal Sharing	52	21	4		58	23	5	1	100			
5 Early Additive	29	43	18	2	32	52	26	4		100		
6 Advanced Additive	9	25	31	11	4	18	40	16			100	
7 Advanced Multiplicative	1	9	43	52	1	5	27	56				78
8 Advanced Proportional			4	36			1	23				22
Total stages 6–8	10	34	78	98	5	23	68	95	0	0	100	100
Fractions												
4 Unit fractions recognised	34	16	4	1	37	17	6	1	32	15	5	1
5 Orders units fractions	40	48	29	6	40	54	36	12	45	52	33	13
6 Co-ordinates numbers & denominators	8	22	31	15	7	17	32	23	8	20	37	22
7 Equivalent fractions	1	7	25	38	2	5	18	36	2	6	18	36
8 Orders mixed fractions		2	9	41	1	1	6	28		1	6	28
Total stages 6–8	9	31	65	94	9	23	55	87	9	27	61	86
Place Value												
4 Ten as a counting unit	50	21	4	1	50	24	6	1	42	19	7	
5 10s in numbers to 1000	32	45	30	6	33	49	36	14	39	49	33	1
6 10s, 100s, 1000s whole numbers	8	24	35	18	8	19	35	26	9	23	38	14
7 10ths in decimals/orders decimals to 3 places	1	6	19	30	1	4	14	28	1	4	16	26
8 Converts decimals to %	1	2	9	46	1	1	6	32	1	1	5	28
Total stages 6–8	10	32	64	94	9	24	55	85	11	28	59	68

Appendix G – continued

Percentages on All Domains of Students at Stages 4–6 on Each of the Three Strategy Domains

Stage	Additive Domain				Multiplicative Domain				Proportional Domain			
	4	5	6	7	4	5	6	7–8	2–4	5	6	7–8
	AC	EA	AA	AM	AC	EA	AA	AM/AP	ES	EA	AA	AM/AP
<i>Number of students</i>	1401	5277	4652	3311	1233	3309	5559	5944	2091	3918	3821	6456
Basic Facts												
4 Addition with tens & doubles	24	9	2		26	9	2		21	8	2	1
5 Addition & multiplication facts 2, 5, 10	37	34	12	2	40	40	17	4	39	36	13	5
6 Subtraction & multiplication facts	19	37	36	18	16	34	43	24	22	35	43	26
7 Division facts	5	15	43	50	4	12	33	51	6	16	36	49
8 Common factors/multiples	0	1	6	31	0	1	3	21	0	1	4	19
Total stages 6–8	24	53	85	98	21	47	79	96	28	52	83	95
Sequence Forwards												
4 FNWS to 100	18	3			14	4	1		12	3	1	
5 FNWS to 1 000	60	49	23	5	64	56	28	10	60	51	26	11
6 FNWS to 1 000 000	20	47	77	94	19	40	71	89	25	46	73	89
Sequence Backwards												
4 BNWS from 100	24	4	1		21	5	1		17	4	1	
5 BNWS from 1 000	57	53	25	4	61	58	31	11	60	55	29	11
6 BNWS from 1 000 000	17	43	75	96	17	37	68	89	21	41	70	89

Appendix H (Analysis of 2007 Data from the Numeracy Development Projects: What Does the Picture Show?)

Percentages of Year 5–9 Students at Each Stage on Place Value on Stages of Other Domains (Final 2007)

Stage on Place Value	0–1	2	3	4	5	6	7	8
Tasks used to determine stages on the Framework for Place Value	Emergent	One as a unit	Five as a unit	Ten as a unit	10s in numbers to 1000	10s, 100s, 1000s in whole numbers	10ths in decimals, orders decimals	Decimal conversions
<i>Number of students</i>	20	65	122	2102	4939	4213	2578	2191
Additive Domain								
0 Emergent	25	2						
1 1:1 Counting	5	5	2					
2 Count from One with Materials	30	29	5	1				
3 Count from One with Imaging	20	17	12	1				
4 Advanced Counting	10	35	47	33	9	3	1	
5 Early Additive Part–Whole	5	12	28	51	48	30	13	5
6 Advanced Additive Part–Whole	5		7	13	39	54	49	28
7 Advanced Multiplicative Part–Whole				1	4	14	38	68
Total stages 5–7	10	12	35	65	91	97	99	100
Multiplicative Domain								
n/a Not entered	55	45	6	3		1		
2–3 Count from One	30	28	20	5	1			
4 Advanced Counting	10	22	49	34	10	3		
5 Early Additive Part–Whole	5	6	16	38	32	15	5	2
6 Advanced Additive Part–Whole			8	17	41	46	31	14
7 Advanced Multiplicative Part–Whole			1	3	15	31	49	40
8 Advanced Proportional Part–Whole					1	5	15	44
Total stages 5–8	5	6	25	58	89	97	99	100
Proportional Domain								
n/a Not entered	55	46	7	4	1	1	1	
1 Unequal sharing	10	8	8	2				
2–4 Equal sharing	30	43	57	42	17	5	1	1
5 Early Additive Part–Whole	5	3	22	36	39	21	7	2
6 Advanced Additive Part–Whole			3	12	26	34	24	9
7 Advanced Multiplicative Part–Whole			3	3	17	36	56	47
8 Advanced Proportional Part–Whole					1	3	13	41
Total stages 5–8	5	3	28	51	82	94	98	99

Appendix H – continued

Percentages of Year 5–9 Students at Each Stage on Place Value on Stages of Other Domains (Final 2007)

Stage on Place Value	0–1	2	3	4	5	6	7	8
Tasks used to determine stages on the Framework for Place Value	Emergent	One as a unit	Five as a unit	Ten as a unit	10s in numbers to 1000	10s, 100s, 1000s in whole numbers	10ths in decimals, orders decimals	Decimal conversions
<i>Number of students</i>	20	65	122	2102	4939	4213	2578	2191
Fractions								
n/a Not entered	60	51	7	3	1			
2–3 Unit fractions not recognised	15	25	37	9	2			
4 Unit fractions recognised	20	19	39	33	13	3	1	
5 Ordered unit fractions	5	5	16	45	52	31	10	3
6 Co-ordinates numbers & denominators		2	1	8	23	36	27	11
7 Equivalent fractions			1	1	8	24	41	34
8 Ordered fractions					2	6	20	52
Total stages 5–8	5	6	18	55	84	96	99	100
Basic Facts								
0–1 Emergent	65	20	3					
2 Addition facts to 5	25	31	8	2				
3 Addition facts to 10	5	23	29	6	1			
4 Addition with 10s & doubles	5	15	32	25	6	1		
5 Addition facts		8	19	41	33	12	3	1
6 Subtraction & multiplication facts		3	8	19	39	42	27	14
7 Division facts			2	6	19	41	56	47
8 Common factors & multiples					1	4	14	38
Total stages 5–8	0	11	29	66	93	99	99	100
Sequence Forwards								
0 Emergent	15							
1 Initial FNWS to 10	20							
2 FNWS to 10	15	20	5					
3 FNWS to 20	15	32	18	1				
4 FNWS to 100	20	35	33	12	2	1		
5 FNWS to 1 000	10	11	40	66	49	21	7	3
6 FNWS to 1 000 000	5	2	3	20	48	78	91	96
Sequence Backwards								
0 Emergent	25	2						
1 Initial BNWS from 10	10	8						
2 BNWS from 10	15	11	3					
3 BNWS from 20	15	32	11	1				
4 BNWS from 100	15	25	44	15	2			
5 BNWS from 1 000	5	9	22	60	40	16	5	1
6 BNWS from 1 000 000	5		3	16	37	58	64	58

Appendix I (Analysis of 2007 Data from the Numeracy Development Projects: What Does the Picture Show?)

*Percentages of Year 5–9 Students at Each Stage on **Basic Facts** on Stages of Other Domains (Final 2007)*

Stage on Basic Facts	0–1	2	3	4	5	6	7	8*
Tasks used to determine stage on the Framework for Basic Facts	Emergent: No recall of addition facts to 5	Addition facts to 5: 2 + 3	Addition facts to 10: 5 + 4 6 + □ = 10	Addition facts with 10 & Dbs: 6 + 6 9 + 9 10 + 4 7 + 10	Addition facts: 8 + 6 6 + 9 8 × 5 5 × 7	Sub'n & mult'n facts: 17 – 9 15 – 6 6 × 7 8 × 4	Division facts: 56 ÷ 7 63 ÷ 9	Common factors (81, 72) & multiples (8, 12)
<i>Number of students</i>	34	96	226	933	3131	5147	5260	1422
Additive Domain								
0 Emergent	15	1						
1 1:1 counting	9	1	2					
2 Count from One with Materials	27	19	4	1				
3 Count from One with Imaging	18	9	8	2				
4 Advanced Counting	32	50	52	36	17	5	1	
5 Early Additive Part-Whole		18	32	50	57	38	15	3
6 Advanced Additive Part-Whole		2	2	10	24	45	53	28
7 Advanced Multiplicative Part-Whole				1	2	11	30	69
Total stages 5–7	0	20	34	61	83	95	99	100
Multiplicative Domain								
Not entered	53	26	12	5	1			
2–3 Count from One	24	24	16	6	2	1		
4 Advanced Counting	18	34	50	41	19	5	1	
5 Early Additive Part-Whole	6	8	18	31	43	22	7	2
6 Advanced Additive Part-Whole		5	3	14	29	46	35	12
7 Advanced Multiplicative Part-Whole		2	1	2	7	23	43	40
8 Advanced Proportional Part-Whole					1	4	13	46
Total stages 5–8	6	16	22	47	79	95	99	100
Proportional Domain								
Not entered	53	28	12	7	2	1	1	
1 Unequal sharing	15	7	5	2	1			
2–4 Equal sharing	32	48	61	47	26	9	3	1
5 Early Additive Part-Whole		15	19	33	45	27	12	2
6 Advanced Additive Part-Whole		1	3	8	16	32	26	12
7 Advanced Multiplicative Part-Whole		1		3	9	28	48	41
8 Advanced Proportional Part-Whole					1	4	11	44
Total stages 5–8	0	17	21	44	71	91	97	99
Fractions								
Not entered	59	21	12	5	1			
2–3 Unit fractions not recognised	21	28	24	10	4	1		
4 Unit fractions recognised	21	32	35	35	19	8	2	1
5 Ordered unit fractions		14	25	42	54	39	18	3
6 Co-ordinates numbers & denominators		3	3	7	17	31	27	12
7 Equivalent fractions		2		1	4	18	34	26
8 Ordered fractions					1	4	18	59
Total stages 5–8	0	19	28	50	76	91	98	99

** Only primary and intermediate students were given the opportunity to do stage 8 basic facts.

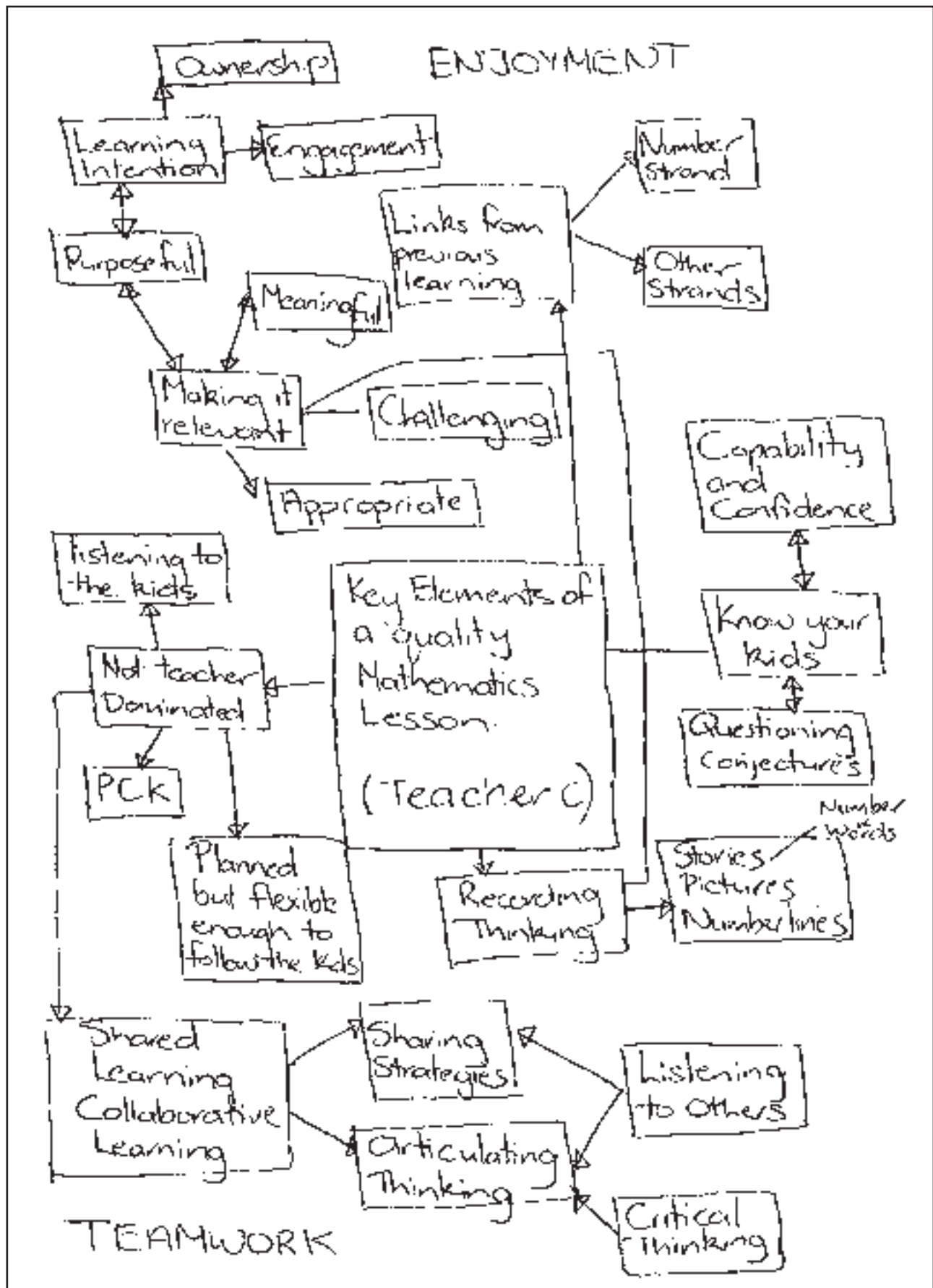
Appendix I – continued

Percentages of Year 5–9 Students at Each Stage on **Basic Facts** on Stages of Other Domains (Final 2007)

Stage on Basic Facts	0–1	2	3	4	5	6	7	8
Tasks used to determine stage on the Framework for Basic Facts	Emergent: No recall of addition facts to 5	Addition facts to 5: 2 + 3	Addition facts to 10: 5 + 4 6 + □ = 10	Addition facts with 10 & Dbs: 6 + 6 9 + 9 10 + 4 7 + 10	Addition facts: 8 + 6 6 + 9 8 × 5 5 × 7	Sub'n & mult'n facts: 17 – 9 15 – 6 6 × 7 8 × 4	Division facts: 56 ÷ 7 63 ÷ 9	Common factors (81, 72) & multiples (8, 12)
<i>Number of students</i>	34	96	226	933	3131	5147	5260	1422
Place Value								
0–1 Emergent	38	5						
2 One as a unit	38	21	7	1				
3 Five as a unit	9	10	16	4	1			
4 Ten as a counting unit	12	51	58	57	28	8	2	
5 10s in numbers to 1000	3	10	18	31	52	38	18	4
6 10s, 100s, 1000s in whole nos		1	2	5	16	35	33	12
7 10ths in decimals/orders decs				1	3	14	27	25
8 Decimal conversions					1	6	20	58
Total stages 5–8	3	11	20	37	71	92	98	100
Sequence Forwards								
0 Emergent	9							
1 Initial FNWS to 10	12							
2 FNWS to 10	15	8	4					
3 FNWS to 20	32	9	10	2				
4 FNWS to 100	21	38	29	16	4	1		
5 FNWS to 1 000	9	41	47	64	59	31	14	4
6 FNWS to 1 000 000	3	4	9	17	36	68	84	94
Sequence Backwards								
0 Emergent	18	1						
1 Initial BNWS from 10	15	8	2					
2 BNWS from 10	9	13	8					
3 BNWS from 20	24	38	35	1				
4 BNWS from 100	12	24	37	20	5	1		
5 BNWS from 1 000	6	2	9	56	50	23	12	3
6 BNWS from 1 000 000	3			14	28	46	59	72

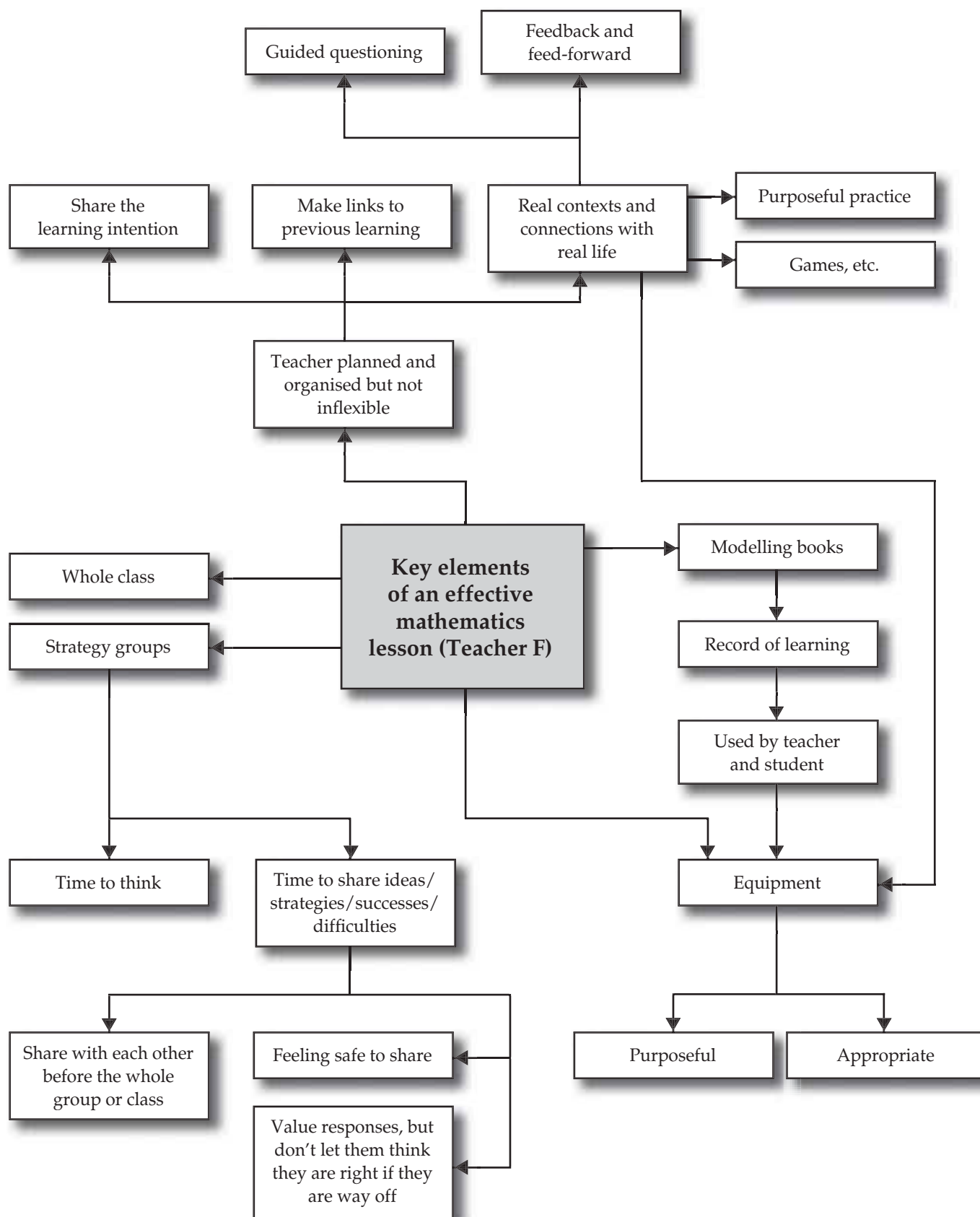
Appendix J (Stepping out of the Stream: Reflecting on Action)

Concept Map, Teacher C



Appendix J – continued

Concept Map, Teacher F



Appendix K (Stepping out of the Stream: Reflecting on Action)

What Would You Expect to See and Hear in an Effective Numeracy Class?

Environment	The Teacher	The Students
<p><i>Classroom displays</i></p> <ul style="list-style-type: none"> • Organisational charts or task boards • Mathematics charts or posters • Students' work and books that include mathematics concepts • Acknowledgment of the cultural diversity of the classroom • A flexible workspace to support individual, pair, and small-group work. 	<p><i>Interaction with others</i></p> <ul style="list-style-type: none"> • Providing whole-class sessions to teach number knowledge • Encouraging a climate where students are valued and feel safe to offer solutions and estimations • Promoting the sharing of ideas and strategies, successes, and difficulties • Highlighting previous number learning and making links to other mathematics strands and curriculum areas • Building connections between mathematics learning and real-life situations. <p><i>Interactions with content</i></p> <ul style="list-style-type: none"> • Using contexts and incorporating problem solving that reflects cultural diversity as appropriate • Sharing the learning intention • Providing feedback and feed-forward in relation to the learning intentions • Promoting small-group strategies for studying a specific strategy stage • Setting purposeful practice activities that link to the strategy outcome teaching lesson • Effectively applying the NDP teaching model • Recording key ideas • Using questioning to elicit responses, extend thinking, and encourage reflection. 	<p><i>Interactions with others</i></p> <ul style="list-style-type: none"> • Enjoying mathematics • Respecting other students' thinking • Working collaboratively and co-operatively. <p><i>Interactions with content</i></p> <ul style="list-style-type: none"> • Demonstrating a sophisticated level of mathematics conversation • Exploring alternative strategies • Engaging in interesting and challenging activities • Refining estimation skills • Expressing mathematical ideas confidently • Illustrating number sense and mental strategies with recording methods that include diagrams, numbers lines, and written statements.
<p><i>Equipment</i></p> <ul style="list-style-type: none"> • Activity boxes or learning centres that are accessible to the students and appropriate to their needs • Number lines appropriate to the students' level • Evidence of the use of calculators and computers, as appropriate. 	<p><i>Interactions with equipment</i></p> <ul style="list-style-type: none"> • Using equipment appropriately to model strategy teaching before imaging or working with number properties only • Teaching games/activities/investigations before they are attempted as independent activities • Involving students in the learning, including learning how to manipulate the materials • Effectively using resources to support numeracy learning. 	<p><i>Interactions with equipment</i></p> <ul style="list-style-type: none"> • Using games as a way of practising strategies and using number knowledge • Working independently • Using mathematics equipment • Participating in self- and peer-assessment.

Appendix L (Multiplicative Thinking: The Challenge for Teachers of Moving from a Procedural to a Conceptual Focus)

Percentages of Teachers who Responded in Particular Ways to the Written Questionnaire

Teachers' Views about Mathematics Learning

For each of the statements below, please tick the box that best represents what you think:

SA	A	U	D	SD
Strongly agree	Agree	Undecided; neither agree nor disagree	Disagree	Strongly disagree

#	Mathematics	SA	A	U	D	SD
1.	Maths is mostly about computation		18	13	48	22
2.	There is always a best way to do a maths problem	2	13	7	64	13
3.	Maths is about searching for patterns	25	55	9	5	7
4.	In maths, things are either right or wrong	2	33	20	38	7
5.	Maths is useful in everyday life	89	11			
6.	Anybody can be good at maths	36	40	13	11	
7.	Maths is important	77	23			
8.	I enjoy using maths myself	59	36	5		
9.	Maths is difficult for me		12	21	40	28
#	Teaching and Learning Mathematics	SA	A	U	D	SD
10.	Students learn maths by being shown the way to interpret symbols, situations, and procedures	12	42	33	9	5
11.	Equipment is useful for helping students of any age learn maths	58	42			
12.	Helping students to make sense of mathematics is important	71	29			
13.	It is important for students to get the answer right	5	32	32	30	2
14.	The best way to solve an addition or subtraction problem is to line up the numbers in columns, then add or subtract the ones, then the tens, etc		4	22	49	24
15.	Students should be encouraged to develop their own mathematical ideas and ways of doing things	40	53	7		
16.	Students learn best through solving problems in everyday situations	40	58	2		
17.	Calculators can provide valuable opportunities for mathematics learning	16	53	24	4	2
18.	Being able to memorise mathematical facts and procedures is important for maths learning	16	50	25	7	2
19.	Solving problems mentally is an important aspect of maths	51	40	4	4	
20.	Students should be given lots of practice with the procedures they have been taught	42	49	7	2	
21.	It is important for students to be able to work out their answers quickly	7	27	38	20	9
22.	Maths is best taught with students in ability groups	24	49	20	4	2

Appendix L – continued*Percentages of Teachers who Responded in Particular Ways to the Written Questionnaire*

For each of the statements below, please tick the box that best represents what you think:

A	O	S	H	N
Always	Often	Sometimes	Hardly ever	Never

#	Classroom Mathematics Practices	A	O	S	H	N
23.	I encourage students to explain their thinking to each other	27	58	16		
24.	I give students maths projects and investigations	7	34	48	11	
25.	I use a textbook for teaching mathematics	5	25	43	25	2
26.	I encourage students to work together on solving problems	23	51	23	2	
27.	I try to find out how students worked out their answers	41	55	5		
28.	I give students free access to calculators whenever they need them	2	36	47	11	4
29.	I use worksheets for teaching mathematics		36	44	16	4
30.	I encourage students to use equipment to help them solve problems	54	37	9		
31.	I work collaboratively with students to decide on their learning goals in maths	9	39	32	18	2
32.	I expect students' maths books to show their working out	36	50	9	5	
33.	The main tool I use for assessing maths learning is paper-and-pencil tests		18	50	30	2
34.	I expect children to pose questions for mathematical exploration	7	42	42	9	
35.	I encourage students to work at maths on their own	2	33	56	7	2
36.	I expect children to come up with ideas for our maths programme		18	41	32	9
37.	I encourage students to include in their maths books drawings, diagrams, or other recording methods which represent their thinking	27	36	30	7	
38.	I group my students in mathematics according to their ability	49	44	7		
39.	I use a technique or game (e.g., "quick tens") to make sure every student can recall basic facts quickly	19	61	19		2
40.	I use whole class teaching for maths		21	66	14	
41.	I enjoy learning about ways to help students learn maths more effectively	57	38	5		
42.	I enjoy teaching maths	53	42	4		
43.	I am confident about teaching mathematics	31	51	13	4	
44.	I prefer teaching subjects other than maths	2	14	56	16	12

Appendix L – continued*Percentages of Teachers who Responded in Particular Ways to the Written Questionnaire*

For teachers who have had experience with the Numeracy Development Projects

SA	A	U	D	SD
Strongly agree	Agree	Undecided; neither agree nor disagree	Disagree	Strongly disagree

#	Statement	SA	A	U	D	SD
45.	I found the professional development for the Numeracy Project helpful for my teaching	57	34	5	5	
46.	I have gone back to the way I taught mathematics before being involved in the Numeracy Project		14	14	41	32
47.	I have adapted the ideas from the Numeracy Project to suit my own teaching practice	21	65	12	2	

1
Little impact

5
Considerable impact

#	Statement	1	2	3	4	5
I-1.	How has participation in the Numeracy Project impacted on your mathematical content knowledge?	7	11	16	33	33
I-2.	How has participation in the Numeracy Project impacted on your knowledge of teaching mathematics?	2		22	36	40
I-3.	How has participation in the Numeracy Project impacted on your knowledge of how students learn mathematics?		4	16	44	36
I-4.	How has participation in the Numeracy Project impacted on your own understanding of multiplication/division and/or fractions?	7	9	20	38	27
I-5.	How has participation in the Numeracy Project impacted on your approach to teaching multiplication/division and/or fractions?	2		16	43	39
I-6.	How has participation in the Numeracy Project impacted on your students' mathematics learning?	2	2	28	30	37

Teaching Background: Years of teaching altogether

Years	%
1 or less	17
2	13
3-4	13
5-6	15
7-9	8
10-14	7
15-19	7
20-24	9
25+	4

Mathematics Background: Highest mathematics qualification at secondary school

Years	%
11	24
12	53
13	16

Appendix M (Evaluation of the Mathematics Coaches Pilot Project)

Questions for Coaches

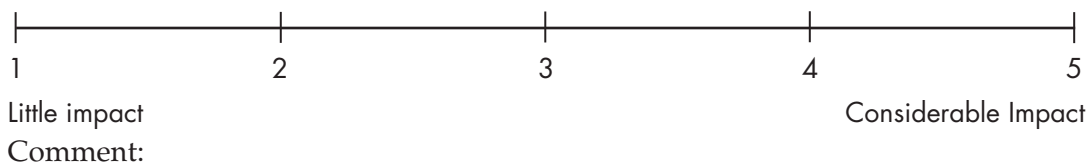
The project aimed to meet the needs of individual teachers, especially in multiplication and division, proportion and ratio, and the linking of the other strands to the Number Framework.

NOTE: The term *your teachers* is used to describe the teachers whom you coach as part of the project.

<p>How has participation in the project impacted on your teachers' knowledge of multiplication and division and of proportion and ratio?</p> <div style="display: flex; align-items: center; margin-bottom: 10px;"> <div style="flex: 1; border-bottom: 1px solid black; position: relative;"> <div style="position: absolute; left: 0; bottom: -10px;">1</div> <div style="position: absolute; left: 25%; bottom: -10px;">2</div> <div style="position: absolute; left: 50%; bottom: -10px;">3</div> <div style="position: absolute; left: 75%; bottom: -10px;">4</div> <div style="position: absolute; right: 0; bottom: -10px;">5</div> </div> <div style="margin-left: 10px; text-align: center;"> <p>Little impact</p> <p>Comment:</p> </div> <div style="margin-left: 100px; text-align: center;"> <p>Considerable Impact</p> </div> </div>
<p>How has participation in the project impacted on your teachers' teaching of multiplication and division and of proportion and ratio?</p> <div style="display: flex; align-items: center; margin-bottom: 10px;"> <div style="flex: 1; border-bottom: 1px solid black; position: relative;"> <div style="position: absolute; left: 0; bottom: -10px;">1</div> <div style="position: absolute; left: 25%; bottom: -10px;">2</div> <div style="position: absolute; left: 50%; bottom: -10px;">3</div> <div style="position: absolute; left: 75%; bottom: -10px;">4</div> <div style="position: absolute; right: 0; bottom: -10px;">5</div> </div> <div style="margin-left: 10px; text-align: center;"> <p>Little impact</p> <p>Comment:</p> </div> <div style="margin-left: 100px; text-align: center;"> <p>Considerable Impact</p> </div> </div>
<p>How has the project impacted on your teachers' ability to make links between the Number Framework and other strands of the mathematics curriculum?</p> <div style="display: flex; align-items: center; margin-bottom: 10px;"> <div style="flex: 1; border-bottom: 1px solid black; position: relative;"> <div style="position: absolute; left: 0; bottom: -10px;">1</div> <div style="position: absolute; left: 25%; bottom: -10px;">2</div> <div style="position: absolute; left: 50%; bottom: -10px;">3</div> <div style="position: absolute; left: 75%; bottom: -10px;">4</div> <div style="position: absolute; right: 0; bottom: -10px;">5</div> </div> <div style="margin-left: 10px; text-align: center;"> <p>Little impact</p> <p>Comment:</p> </div> <div style="margin-left: 100px; text-align: center;"> <p>Considerable Impact</p> </div> </div>
<p>How has the project impacted on your teachers' teaching of other strands of the mathematics curriculum?</p> <div style="display: flex; align-items: center; margin-bottom: 10px;"> <div style="flex: 1; border-bottom: 1px solid black; position: relative;"> <div style="position: absolute; left: 0; bottom: -10px;">1</div> <div style="position: absolute; left: 25%; bottom: -10px;">2</div> <div style="position: absolute; left: 50%; bottom: -10px;">3</div> <div style="position: absolute; left: 75%; bottom: -10px;">4</div> <div style="position: absolute; right: 0; bottom: -10px;">5</div> </div> <div style="margin-left: 10px; text-align: center;"> <p>Little impact</p> <p>Comment:</p> </div> <div style="margin-left: 100px; text-align: center;"> <p>Considerable Impact</p> </div> </div>

Appendix M – continued

Describe **any other areas** where the mathematics coaching project has improved your teachers' understanding of mathematics or of the teaching of mathematics.



What were the **main areas** in which your teachers needed support for the teaching of mathematics?

Comment on the mathematics coaching project as an opportunity for professional growth for you as an individual.

Benefits:

Disadvantages:

Other:

Only answer this question if you worked as a mathematics coach **in more than one school**.

Comment on your experience of working in more than one school.

Advantages:

Disadvantages:

Other:

Appendix M – continued

What have been the **main benefits** of the mathematics coaching project?

Describe any **drawbacks** of the mathematics coaching project.

Comment on your experience of the mathematics coaches initiative as a means of providing sustainability support for teaching of mathematics.

Are there **any other comments** that you would like to make about the project?

Appendix N (Using a Video-link to Engage Numeracy Facilitators in Professional Development in Mathematics)

Video-link Questionnaire (electronic)

We are interested in your opinion of the video-link delivery of the mathematics course you were involved in last year. Thank you for taking the time to complete this questionnaire.

1. How many of the video sessions were you able to attend?
2. Which was the most valuable session?
3. Did you use any of the material in your work with teachers?
4. Would you recommend this course to a colleague who was new to the facilitator role?
5. Do you think what you got out of the course was limited, enhanced, or unaffected by the delivery via video link?
6. In an ideal situation, how would you like to learn the type of content presented on this course?
7. Please make any other comments you would like to about the video delivery.
8. What would you like to see in an ideal facilitators' professional development course?

Appendix N – continued

Group interview questions

Tell me about your experience of this course.

If the course was being reviewed, which parts would you say were absolutely essential and must be kept?
What would you suggest should be altered? Why?
What are the main things you are learning from this course?
What aspects of the course are helping you learn?
Do you feel this course is helping your work with teachers and schools? If so, in what ways? If not, why not?
(If applicable). Please comment on the use of the video link. What do you see as its advantages/ disadvantages?
What would you say to a facilitator next year who was thinking about doing the course?