Numeracy Project

0	E	Emergent
1	1	One to one Counting
2	CAM	Counting from One on Materials
3	CAI	Counting from One by Imaging
4	AC	Advanced Counting
5	EA	Early Additive
6	AA	Advanced Additive
7	AM	Advanced Multiplication
8	AP	Advanced Proportional

Individualdiagnose und individuelle Förderung

Datengestützter Unterricht in Neuseeland

Michael Katzenbach

Dortmund, 2.12.2010

UNIVERSITY of OTAGO
Te Whare Wānanga o Otāgo
NEW ZEALAND

Dunedin

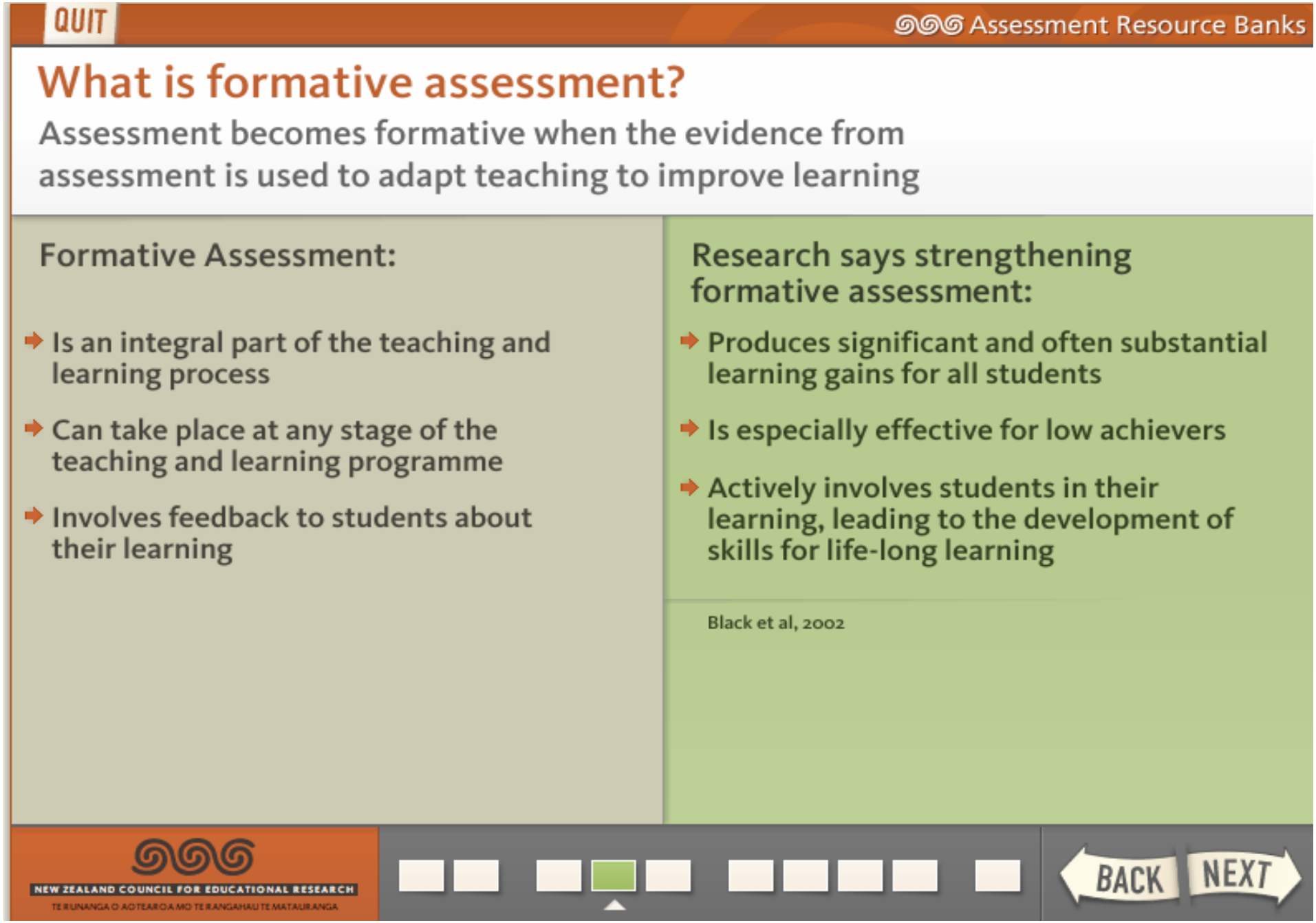
University of Otago
College of Education

A ssessment f or L earning

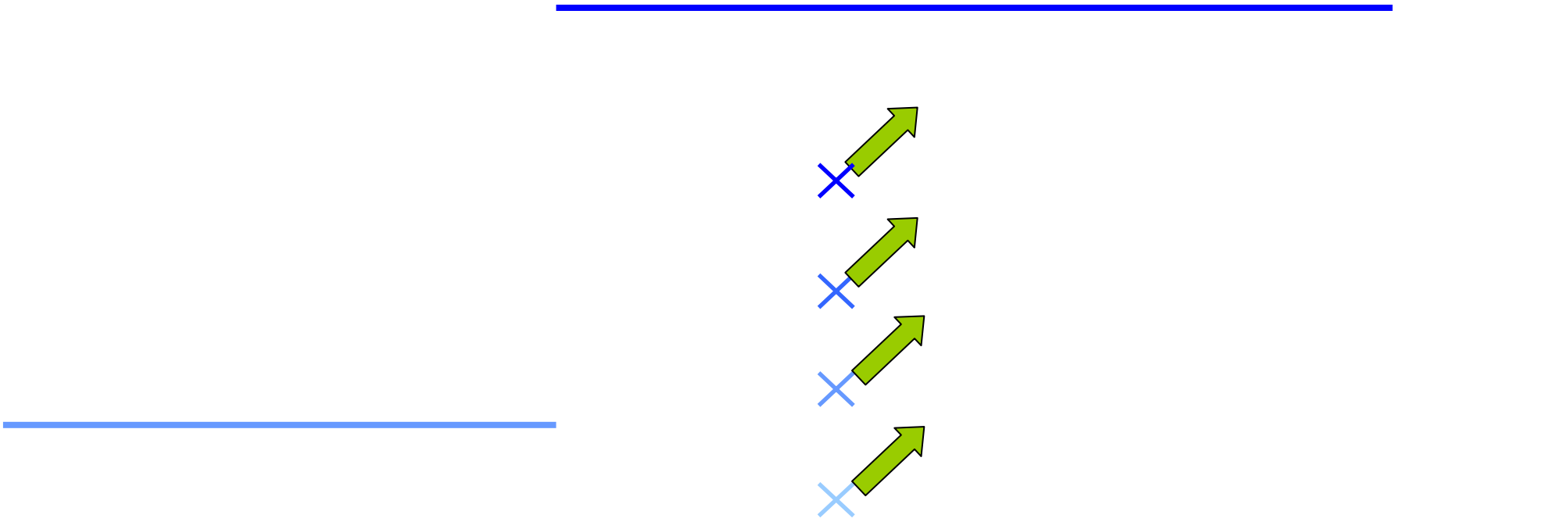
„In zahlreichen empirischen Studien zeigte sich …, dass vor allem leistungsschwächere Schüler von formativen Leistungsmessungen profitieren und gleichzeitig die Leistungswerte aller Schüler gesteigert werden konnten.“
(Verweis auf Black, Timperley, Hattie)

Maier, U.: Formative Assessment – ein erfolgversprechendes Konzept zur Reform von Unterricht und Leistungsmessung. In: ZfE (2010), S. 300

Formative Assessment

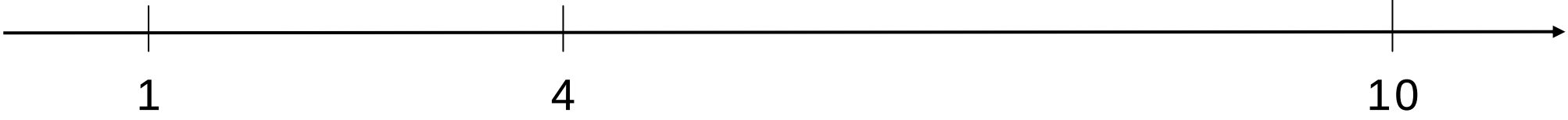


Formative Assessment



Where is the child at?

What is the next learning step?



Absichten:

- Möglichkeit zur aktiven Auseinandersetzung mit Diagnose- und Fördermaterialien Neuseelands geben
- Über Fortbildung und Assessment in Neuseeland informieren
- Möglichkeit zum Austausch zu systematischen Ansätzen formativer Beurteilung geben
- Entwicklungen, Herausforderungen und Perspektiven der Standardsicherung, Standardüberprüfung und Schulentwicklung disktieren

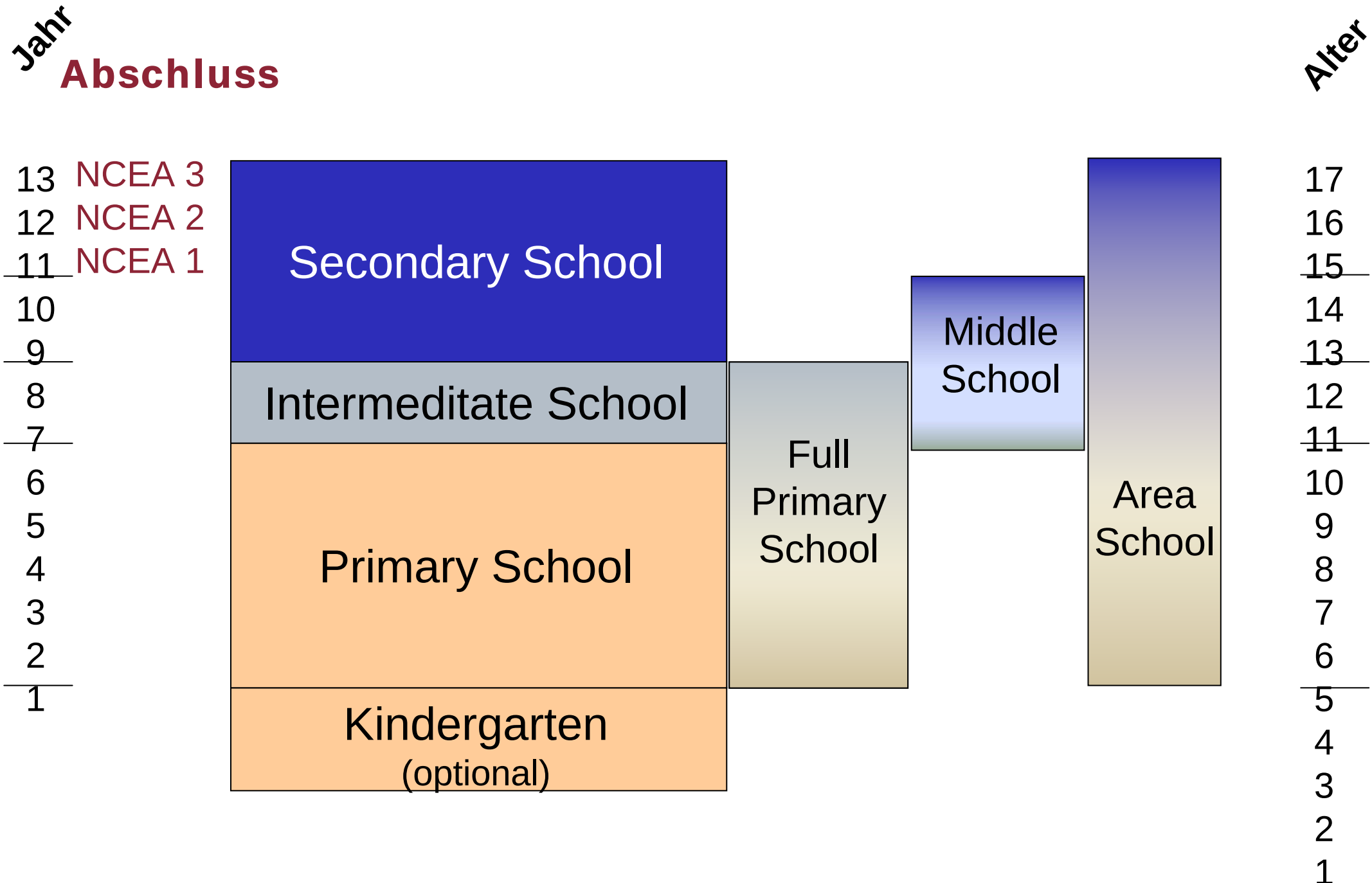
Übersicht

- AfL
- Fortbildungskonzept Numeracy
    - Kompetenzentwicklungsmodell
    - Diagnostisches Interview
    - Unterrichtsskript
- Assessment
- ggf. Arbeit mit Projektmaterialien
- Diskussion

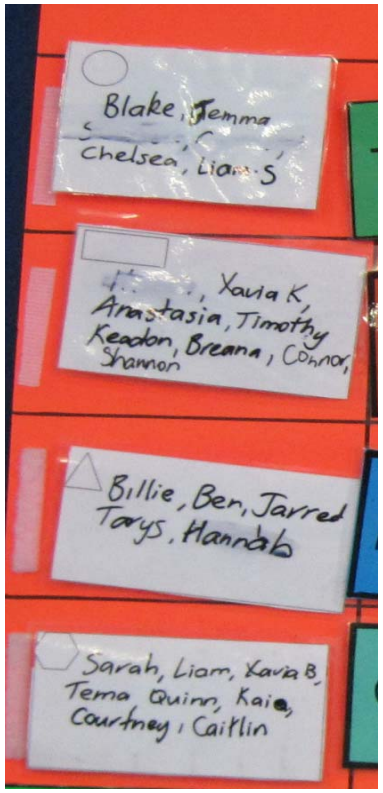
Reform des Mathematikunterrichts

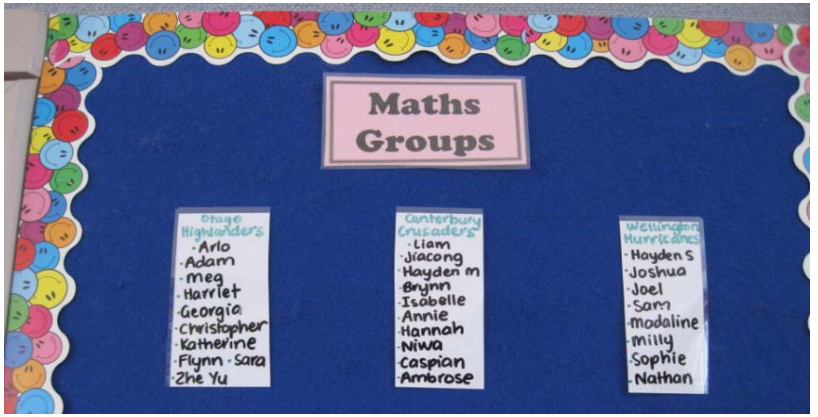
- TIMSS 1997
- Mangelnde Akzeptanz des neuen Curriculums
- Nationale Projektgruppe
  - individuelle Förderung aller Lernenden
  - insbesondere Unterstützung der Maori
- Count Me In Too (Australien, Jahrgänge 1 – 3)
- Erprobung, wissenschaftliche Begleitung
- Erste Umsetzung 2000
- Schrittweise Erweiterung des Programms auf die Jahrgänge 4 – 10

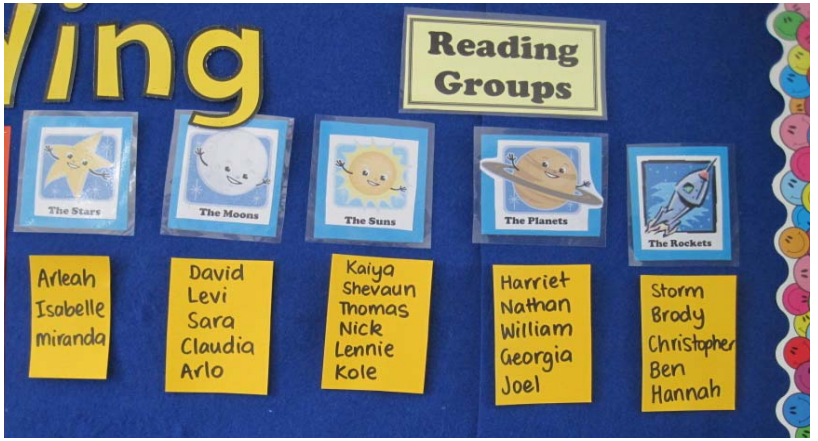
Schulsystem



Differenzierung auf mehreren Niveaus







Kompetenzentwicklungsmodell

Strategy Framework

0	E	Emergent
1	1	One to one Counting
2	CAM	Counting from One on Materials
3	CAI	Counting from One by Imaging
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Kompetenzentwicklungsmodell

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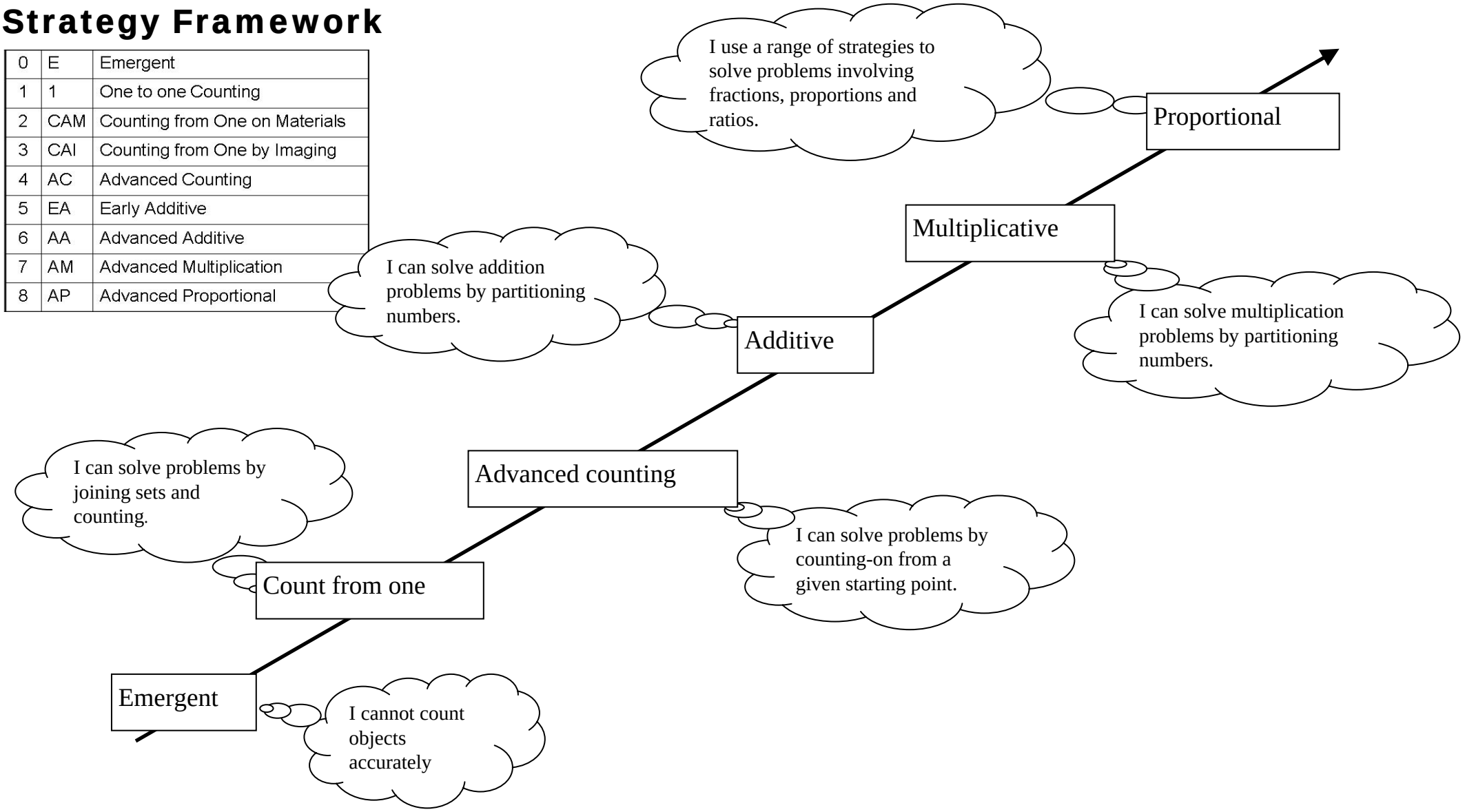

Gruppenbildung

Strategy Framework

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Diagnostisches Interview

Gruppenbildung

NZMATHS new zealand maths

Numeracy Project

Class Grouping Sheet for NumPA (Stages 4-8)

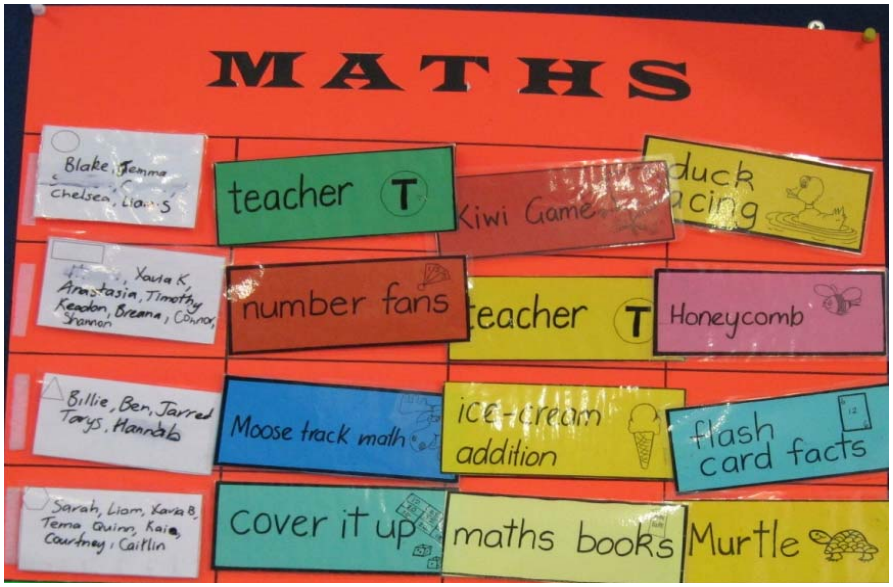
Teacher	Ms Print	School	Tapworth Primary	Operation Domain	

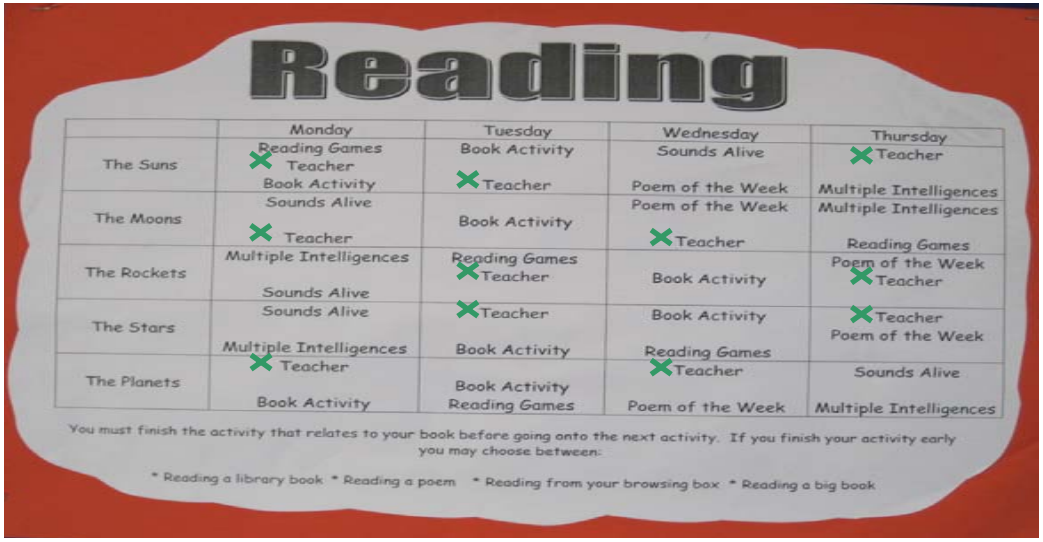
Knowledge Hot Spots	One more/less with whole numbers to 999 999 Ordering of unit fractions, improper fractions as mixed numbers Tens, hundreds, thousands in whole numbers to 999 999

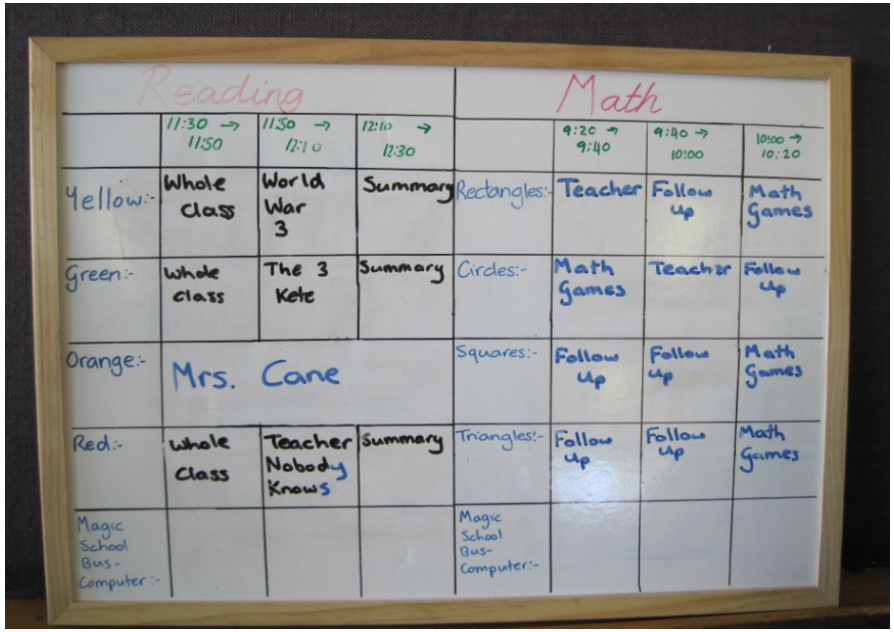
Advanced Counting						Early Additive						Advanced Additive						Advanced Multiplicative						A
	FNWS	BNWS	F	PV	BF		FNWS	BNWS	F	PV	BF		FNWS	BNWS	F	PV	BF		FNWS	BNWS	F	PV	BF	
Alby	5	5	5	4	3																			
Bic	5	5	3	4	3																			
Colin	5	4	4	4	3																			
Delia	5	5	4	4	4																			
Elsa	4	4	4	4	3																			
Frank	4	4	5	4	3																			
						Gina	5	5	5	4	4													
						Herb	5	4	4	4	4													
						Indira	5	4	5	5	4													
						Jeeli	4	4	4	4	4													
						Kayla	6	5	4	5	4													
						Lou	5	5	5	4	4													
						Manuel	5	5	5	4	4													
												Nadia	5	5	5	5	5							
												Olive	5	5	5	5	6							
												Pete	5	5	5	5	5							
												Quentin	5	5	5	5	5							
																		Rachel	6	6	6	6	6	
																		Samuel	6	6	6	5	6	

Differenzierung auf mehreren Niveaus

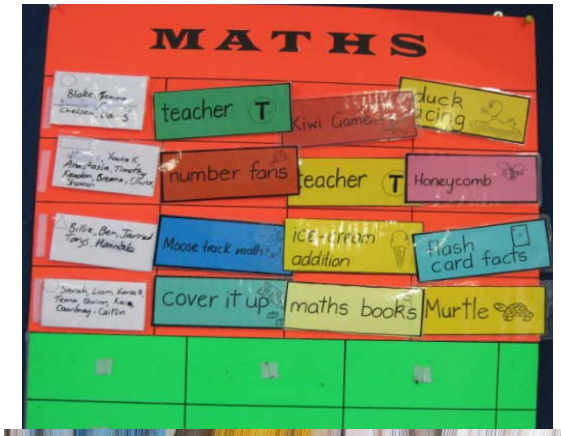
Taskboard

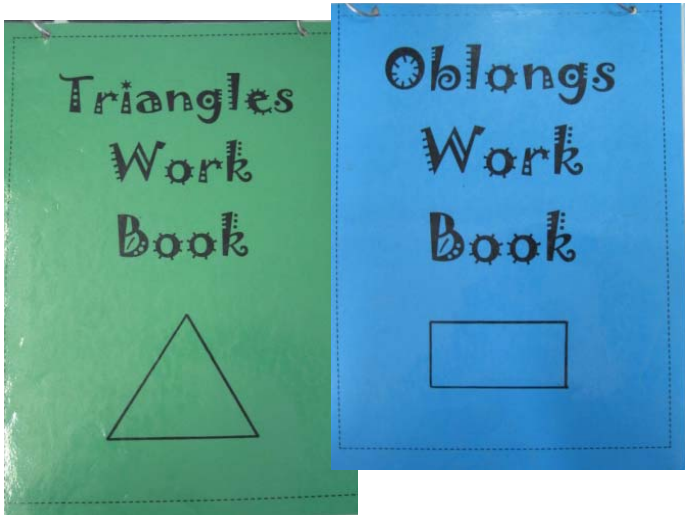




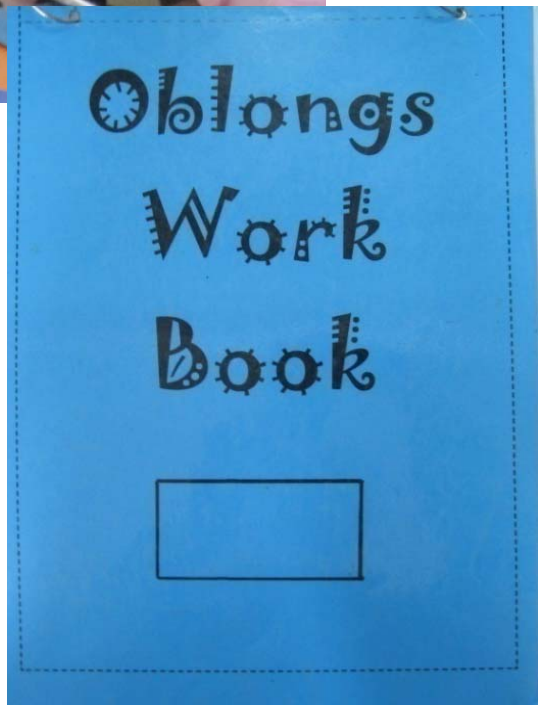


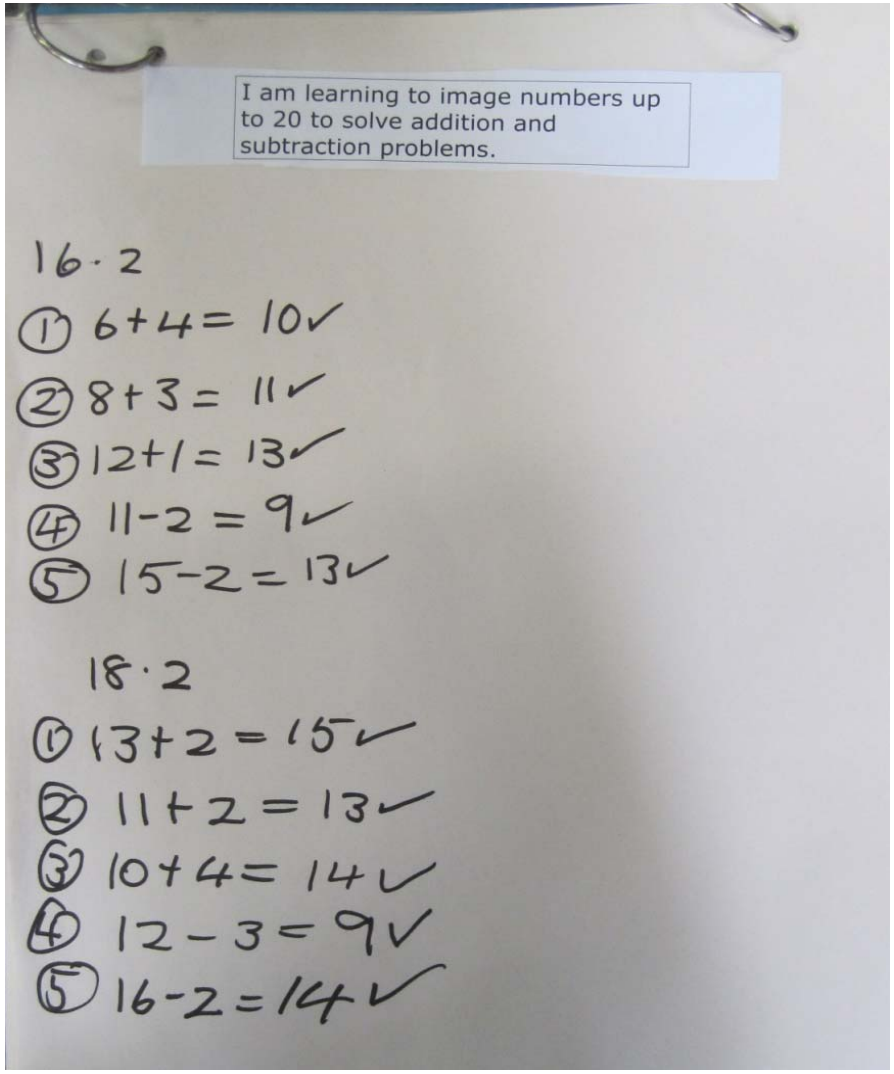
Differenzierung auf mehreren Niveaus



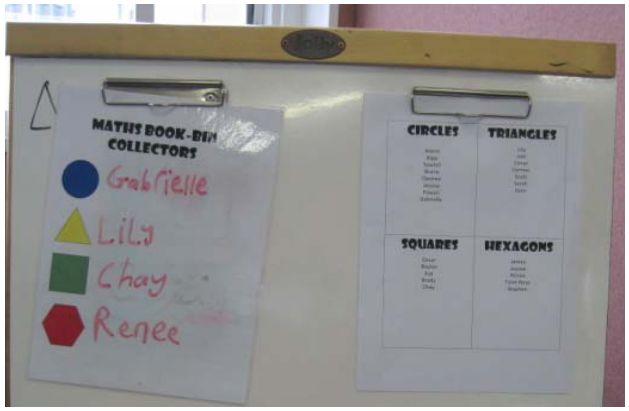


Differenzierung auf mehreren Niveaus





Differenzierung auf mehreren Niveaus

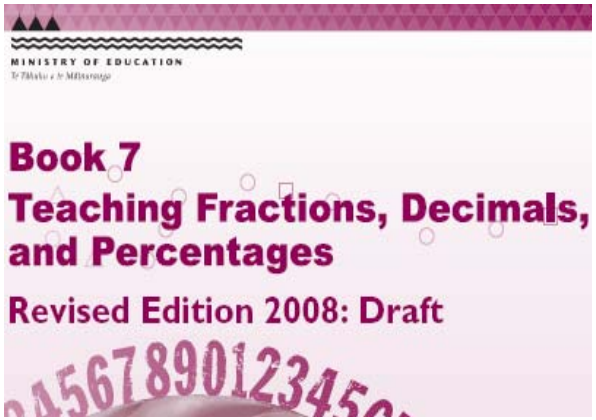


Differenzierung auf mehreren Niveaus

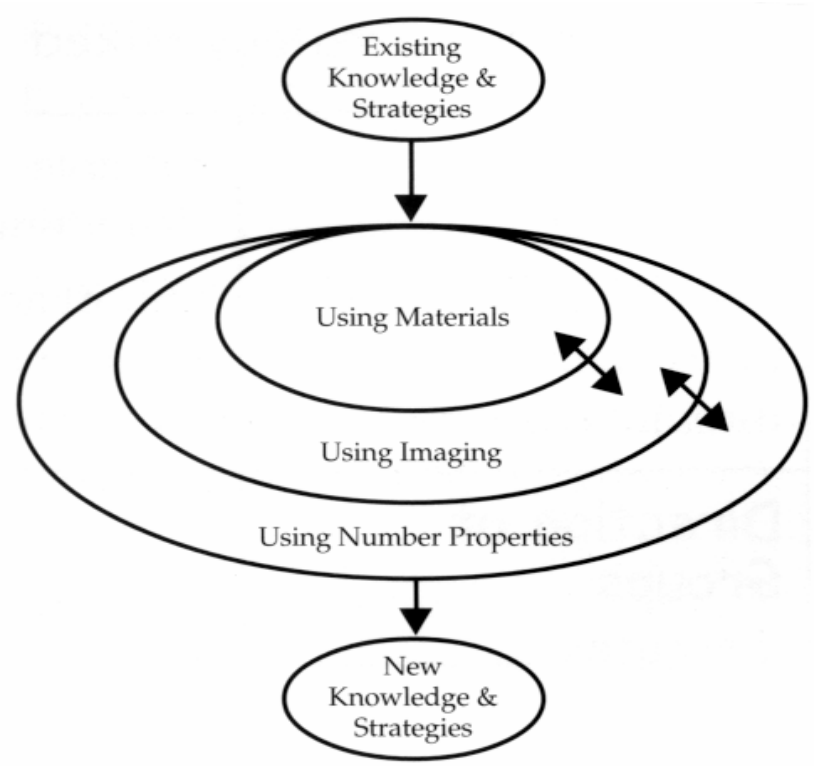
Fortbildung im Numeracy Development Project

Diagnose

Fachdidaktische Fortbildung



Teamteaching



Unterrichtsmodell

0	E	Emergent
1	1	One to one Counting
2	CAM	Counting from One on Materials
3	CAI	Counting from One by Imaging
4	AC	Advanced Counting
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7	AM	Advanced Multiplication
8	AP	Advanced Proportional

Entwicklungs-modell

Diagnose

Fortbildung im Numeracy Development Project

- Fortbildung der gesamten Fachschaft (Schule)
- Dauer: 8 Monate
- 6 Workshops
- 3 Unterrichtsbesuche der Fortbildner
- Leadteacher
- Verbindliche Einbindung der Schulleitung
- Auf das Framework und das Curriculum bezogene Fördermaterialien
- Individuelle Rückmeldung zum Unterrichtserfolg

- Mehr als 95 % der Schulen im Jahrgang 1 – 8
- 85 % der Maori Schulen

Rückmeldung zum Unterrichtserfolg

8 (AP)					6%	13%	15%
7 (AM)			5%	2%	18%	40%	42%
6 (AA)	1%	7%	23%	40%	33%	31%	32%
5 (EA)	10%	29%	45%	45%	31%	12%	11%[2]
4 (AC)	17%	37%	23%	11%	10%	2%	
3 (CAI)	23%	15%	4%	2%	2%	1%	
2 (CA)	36%	8%					
1 (1–1)	8%	4%	1%				
0 (Em)	5%						
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7

Expected level:

Cause for concern:

At risk:

Figure 2. Percentage of the 83 students in the longitudinal study sample at each strategy stage in years 1–7

Significant

changes in teacher attitudes and beliefs happen when they use new practices effectively and **see changes in student learning**.

(Guskey, 1986, p7)

Fortbildung in Neuseeland

Vier Fortbildungsschwerpunkte:

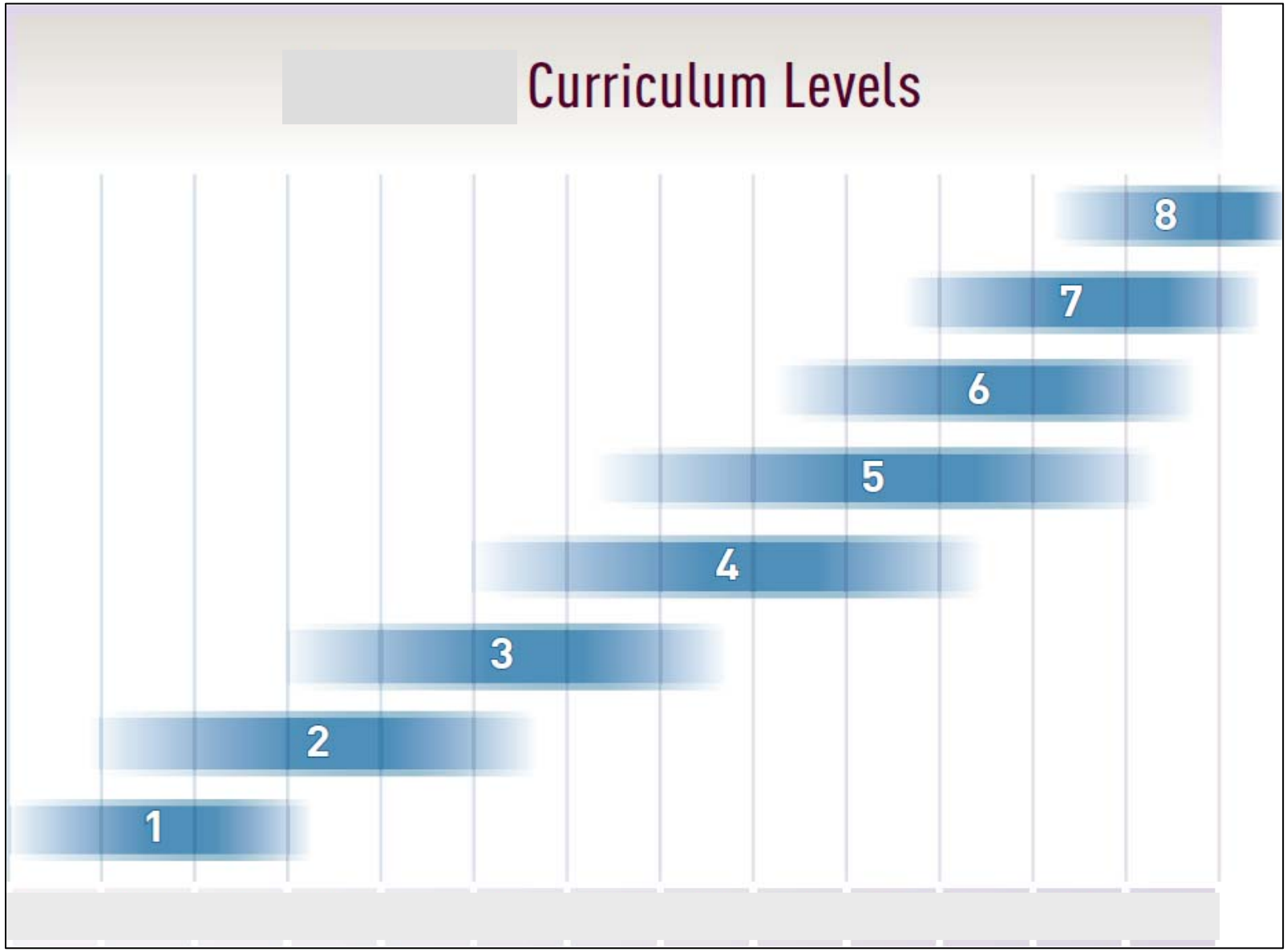
- Literacy
- Numeracy
- Assessment
- Leadership

Landesweite Steuerung

Regionale Teams arbeiten mit den Schulen

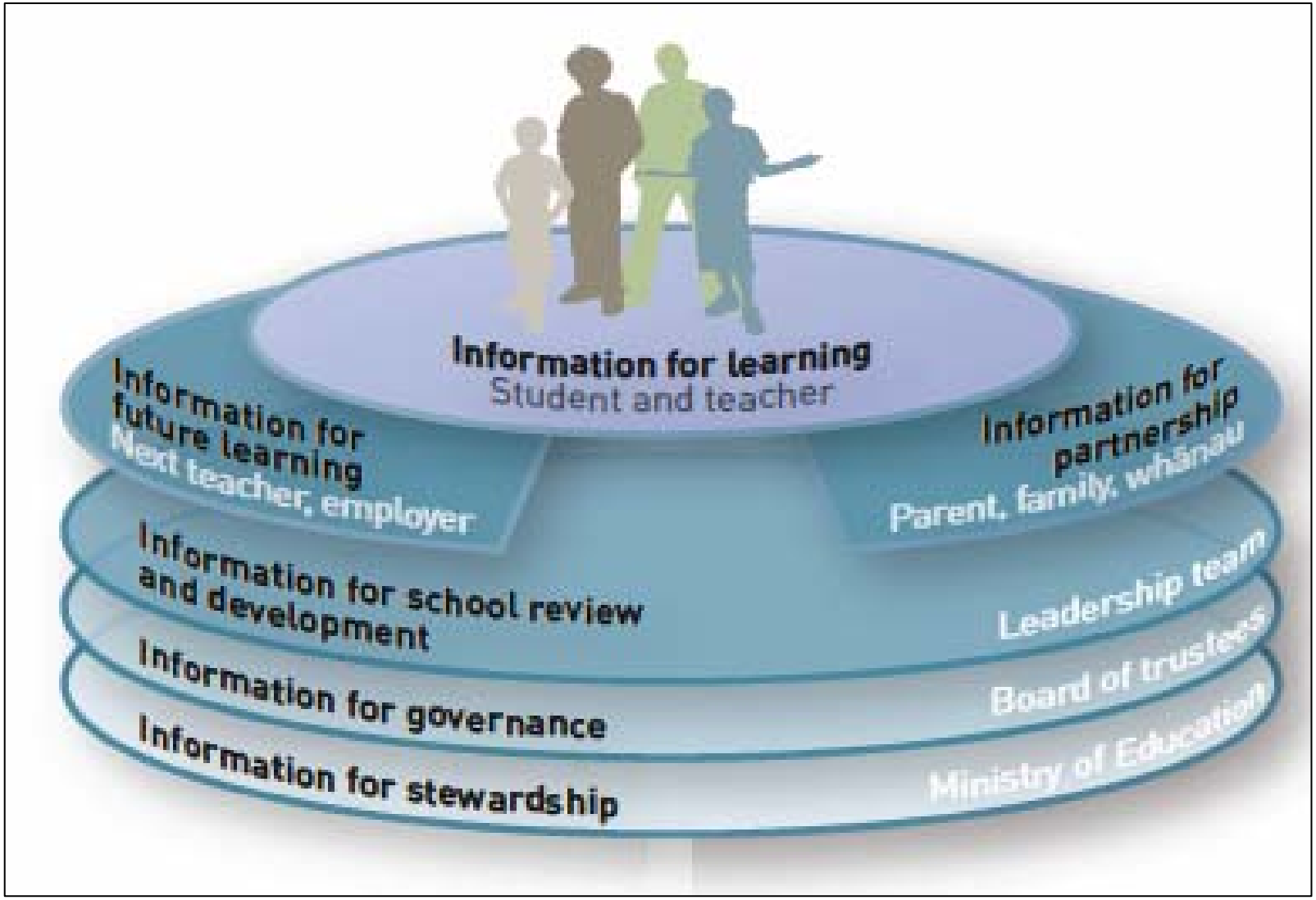
Curriculum

The New Zealand Curriculum

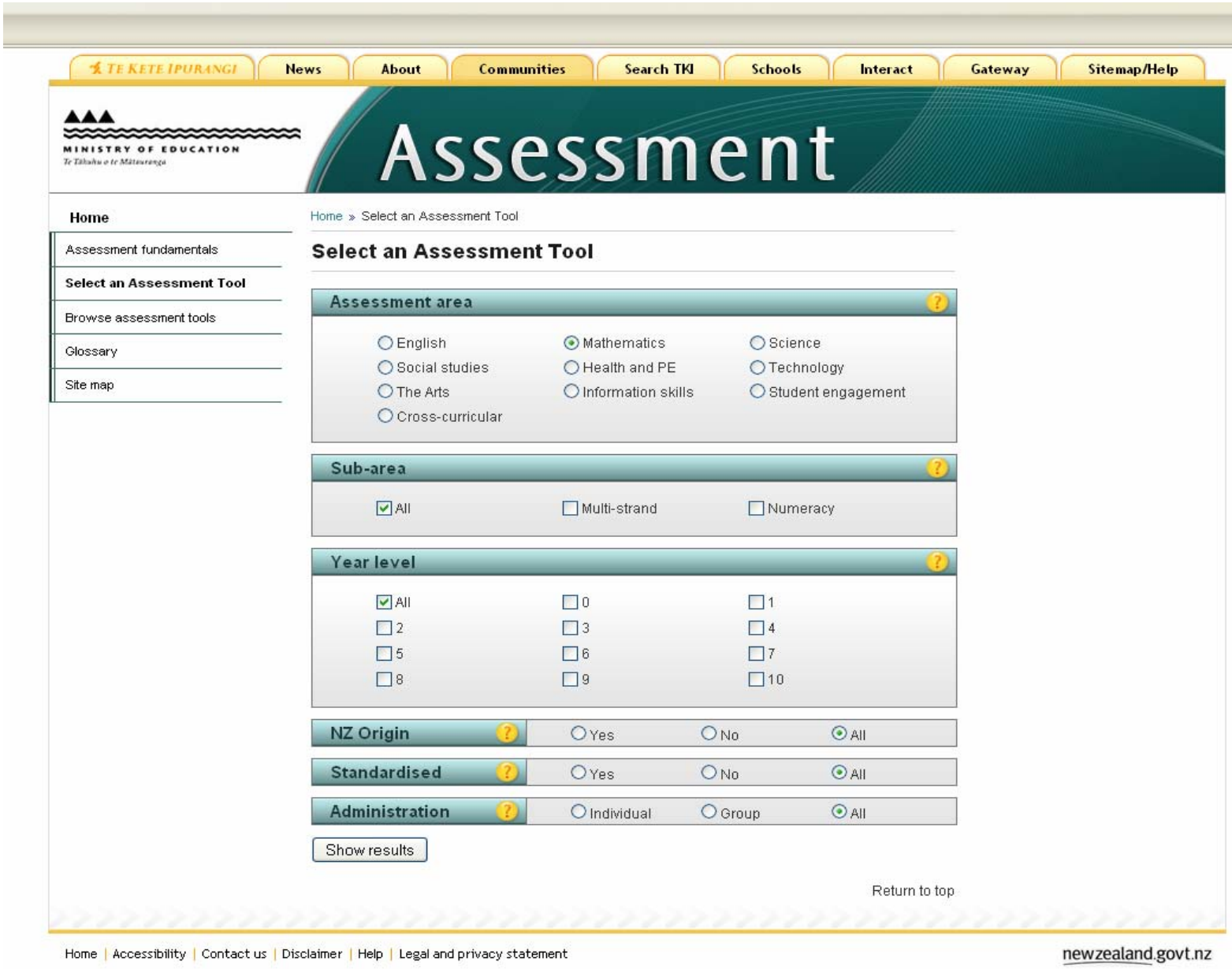


Assessment

The New Zealand Curriculum



Assessment


TE KETE IPURANGI
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Select an Assessment Tool
Assessment area
English
Mathematics
Science
Social studies
Health and PE
Technology
The Arts
Information skills
Student engagement
Cross-curricular
Sub-area
All
Multi-strand
Numeracy
Year level
All
0
1
2
3
4
5
6
7
8
9
10
NZ Origin
Yes
No
All
Standardised
Yes
No
All
Administration
Individual
Group
All
Show results
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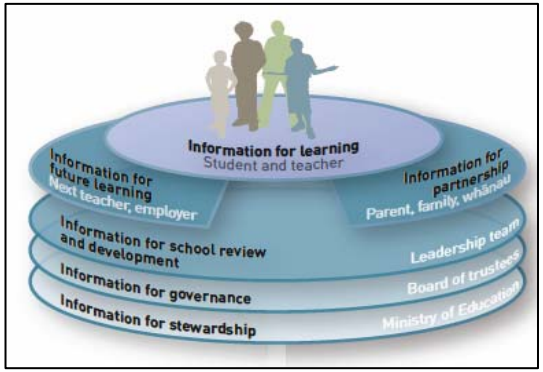
newzealand.govt.nz


Information for learning
Student and teacher
Information for future learning
Next teacher, employer
Information for partnership
Parent, family, whānau
Information for school review and development
Leadership team
Information for governance
Board of trustees
Information for stewardship
Ministry of Education

Assessment

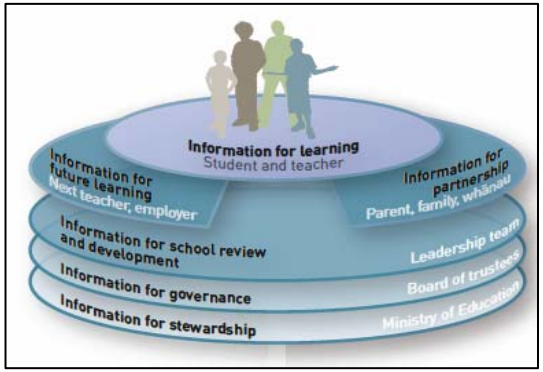
Results

Back to search

Choose up to three tools

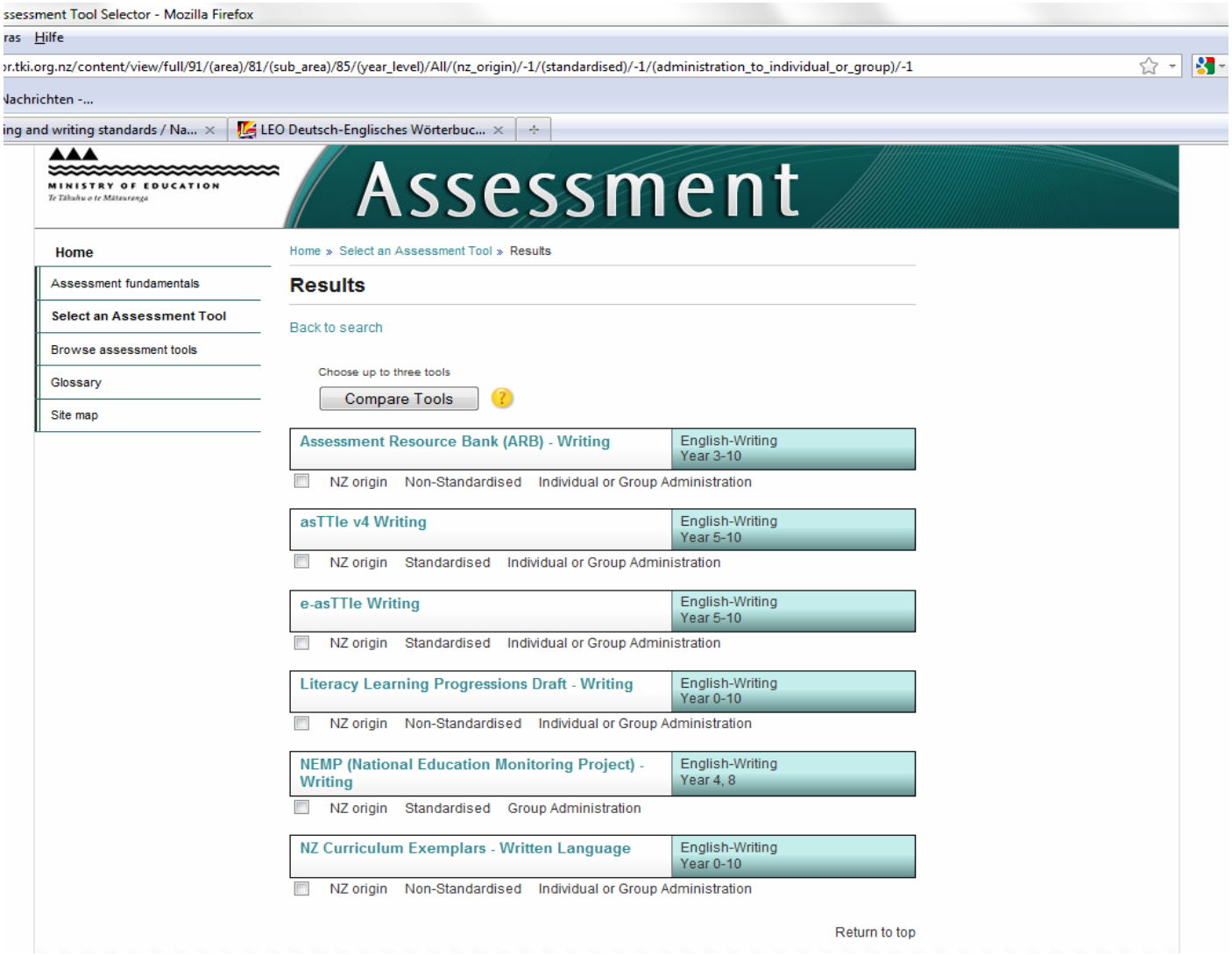
Compare Tools

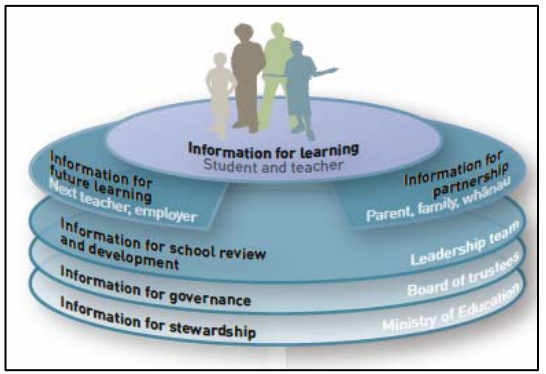
Assessment Resource Bank (ARB) - Mathematics	Mathematics- Multi-strand Year 3-10	NZ origin Non-Standardised Individual or Group Administration
asTTle v4 Mathematics	Mathematics- Multi-strand Year 5-10	NZ origin Standardised Individual or Group Administration
e-asTTle Mathematics	Mathematics- Multi-strand Year 5-10	NZ origin Standardised Individual or Group Administration
NEMP (National Education Monitoring Project) - Mathematics	Mathematics- Multi-strand Year 4, 8	NZ origin Standardised Group Administration
NZ Curriculum Exemplars - Mathematics	Mathematics- Multi-strand Year 0-10	NZ origin Non-Standardised Individual or Group Administration
PAT (Progressive Achievement Test): Mathematics - Revised 2006	Mathematics- Multi-strand Year 3-10	NZ origin Standardised Individual or Group Administration
GloSS - Global Strategy Stage Assessment	Mathematics-Numeracy Year 0-10	NZ origin Non-Standardised Individual Administration
IKAN - Knowledge Assessment for Numeracy	Mathematics-Numeracy Year 3-10	NZ origin Non-Standardised Individual or Group Administration
NumPA - Numeracy Project Assessment (Diagnostic Interview)	Mathematics-Numeracy Year 0-10	NZ origin Non-Standardised Individual Administration



Assessment

Englisch – Schreiben:





Kompetenzentwicklungsmodell

Unterstützung / Qualitätssicherung

Diagnoseinstrumente
Selbsteinschätzungsbögen
Fördermaterial
Erwartungen nach Lernzeiten

Schule

Beurteilung im Lernprozess

Nutzung von Instrumenten zur formativen Beurteilung

Gruppenbildung zur Differenzierung Auswahl Fördermaterial

Selbsteinschätzung der Lernenden

Erfassung von Lernfortschritt

Dokumentation von Lehrerfolg

Rückmeldung von Lernstand und Lern-fortschritt an Lernende und Eltern

Forschung

Curriculum

Ausbildung

Fortbildungsdidaktik: Einstellungen und Haltungen

Schulberatung

Schulinspektion

Landesweite Steuerung

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Evaluation auf Schulebene

Bildungsstandards als Chance

Neben der Beschreibung von Leistungsanforderungen und der Leistungsmessung dienen die Bildungsstandards primär der

Weiterentwicklung des Unterrichts

und vor allem der

verbesserten individuellen Förderung aller Schülerinnen und Schüler.

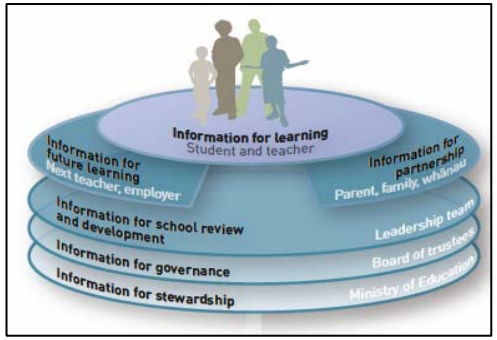
KMK, 2.6.2006

„Bildungsstandards fordern nun dazu heraus, die systematische Förderung der Kompetenzen von Schülerinnen und Schülern in den Mittelpunkt der Schulentwicklung zu stellen.“ (Klieme 2003, S. 52)

Bildungsstandards als Chance

Weiterentwicklung des Unterrichts

verbesserte individuelle Förderung aller Schülerinnen und Schüler



Eltern

Lehrkräfte

Fachkollegium

Schule

Fortbildung

Studienseminar

Schulaufsicht

Universitäten

Qualitätsagenturen

Kooperationen

Kultusministerien

IQB

Kultusministerkonferenz

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Vielen Dank

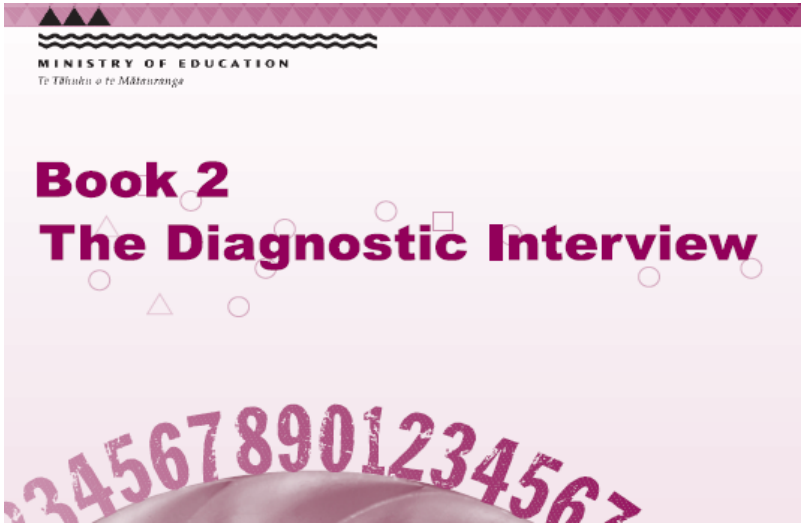
Michael Katzenbach
Amt für Lehrerbildung
Stuttgarter Straße 18 – 24
60329 Frankfurt
069/38989-502
Michael.Katzenbach@afl.hessen.de

Kompetenzentwicklungsmodell

Unterstützung für Schulen

Bereitstellung von

- Diagnoseinstrumenten
- Selbsteinschätzungsbögen
- Informationen zu Erwartungen nach Lernzeiten



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End of Year Two Curriculum Expectations

Curriculum - Level 1					Level 2	Level 3	Level 4	Level 5
Stage 0 Em	Stage 1 1-1	Stage 2 CA	Stage 3 CAI	Stage 4 AC	Stage 5 EA	Stage 6 AA	Stage 7 AM	Stage 8 AP
1%	2%	9%	15%	56%	17%	1%	0%	0%

Longitudinal Study

At Risk

Cause for Concern

Achieving at or above expectations

High Achievers

Kompetenzentwicklungsmodell

Unterstützung für Schulen

Numeracy Project

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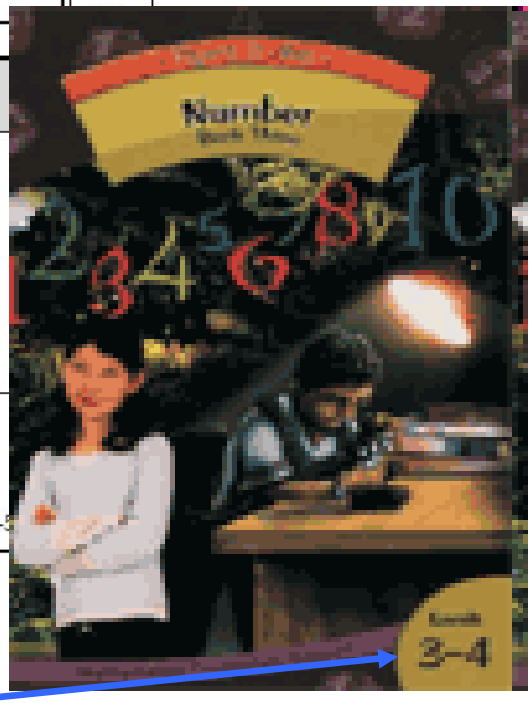
Bereitstellung von Fördermaterial

Transition: Counting from One (CA) to Advanced Counting **Domain: Multiplication and Division**

E
CA
AC
EA

Achievement Objectives	Number: Level 1
	Number Strategies AO1: Use a range of counting, grouping, and equal-sharing strategies with whole numbers and fractions Number Knowledge AO1: Know the forward and backward counting sequences of whole numbers to 100.

Strategies being developed	Problem progression	References	Knowledge being developed	Resources
Solve multiplication problems using skip counting in twos, fives, and tens.	4 × 2 as 2, 4, 6, 8 7 × 2 as 2, 4, 6, 8,10,12,14 3 × 5 as 5, 10, 15 8 × 5 as 5,10,15,20,25,30,35,40 6 × 10 as 10,20,30,40,50,60 5 × 4 as 2,4,6,8,10,12,14,16,18,20, or 5, 10, 15,20	*Teaching Multiplication and Division (Book6)* Introduction (7-8) Number Strips (8-10) *BSM* 11-3-54, 11-3-55	Say the forwards and backwards skip-counting sequences in the range 0-100 for twos, fives, and tens.	*Teaching Number Knowledge (Book 4)* Counting (11) Skip-counting on the Number Line (11) Beep (12) Using Calculators (14) **BSM** 10-1-4, 10-1-44, 10-1-43
Solve division problems by equal sharing in ones, twos and fives.	10 ÷ 2 = 5, 20 ÷ 4 = 5, 14 ÷ 2 = 7, 9 ÷ 3 = 3 12 ÷ 4 = 3, 15 ÷ 3 = 5 25 ÷ 5 = 5, 16 ÷ 4 = 4	*Teaching Multiplication and Division (Book6)* Twos, Fives, and Tens (21-23)	Recall groupings of twos that are in numbers up to 20	*Teaching Number Knowledge (Book 4)* Beep (12) **BSM** 8-1-8, 8-1-50, 9-3-10, 9-3-



Kompetenzentwicklungsmodell

Unterstützung für Schulen

Numeracy Project

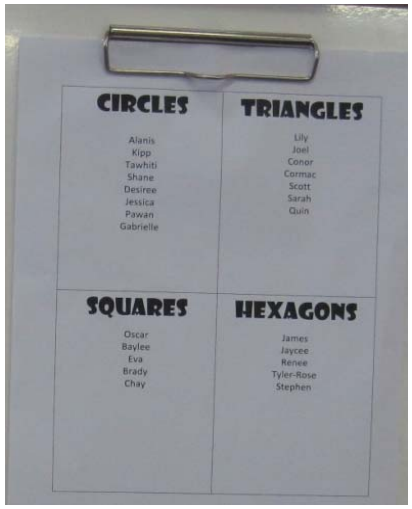
0	E	Emergent
1	1	One to one Counting
2	CAM	Counting from One on Materials
3	CAI	Counting from One by Imaging
4	AC	Advanced Counting
5	EA	Early Additive
6	AA	Advanced Additive
7	AM	Advanced Multiplication
8	AP	Advanced Proportional

Aus- und Fortbildung:

Arbeit an Einstellungen und Haltungen

Änderung von Unterrichtsskripts

Diagnose



Förderung

Kompetenzentwicklungsmodell

Qualitäts-sicherung

- Schulinspektion
- Begleitforschung
- Landesweite Steuerung

Numeracy Project

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1	1	One to one Counting
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	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
8 (AP)					6%	13%	15%
7 (AM)			5%	2%	18%	40%	42%
6 (AA)	1%	7%	23%	40%	33%	31%	32%
5 (EA)	10%	29%	45%	45%	31%	12%	11%[2]
4 (AC)	17%	37%	23%	11%	10%	2%	
3 (CAI)	23%	15%	4%	2%	2%	1%	
2 (CA)	36%	8%					
1 (1–1)	8%	4%	1%				
0 (Em)	5%						

Expected level:

Cause for concern:

At risk:

Figure 2. Percentage of the 83 students in the longitudinal study sample at each strategy stage in years 1–7

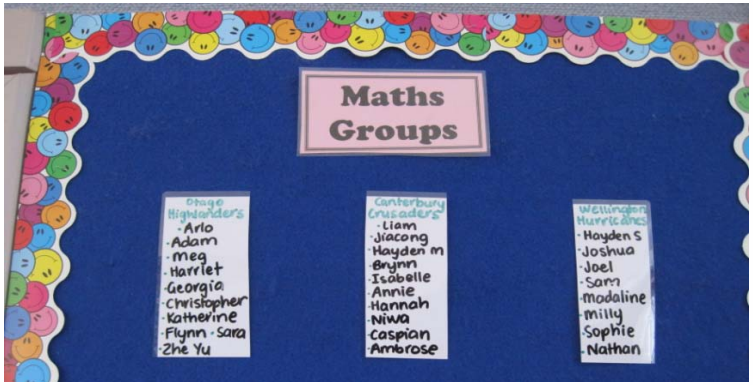
Kompetenzentwicklungsmodell

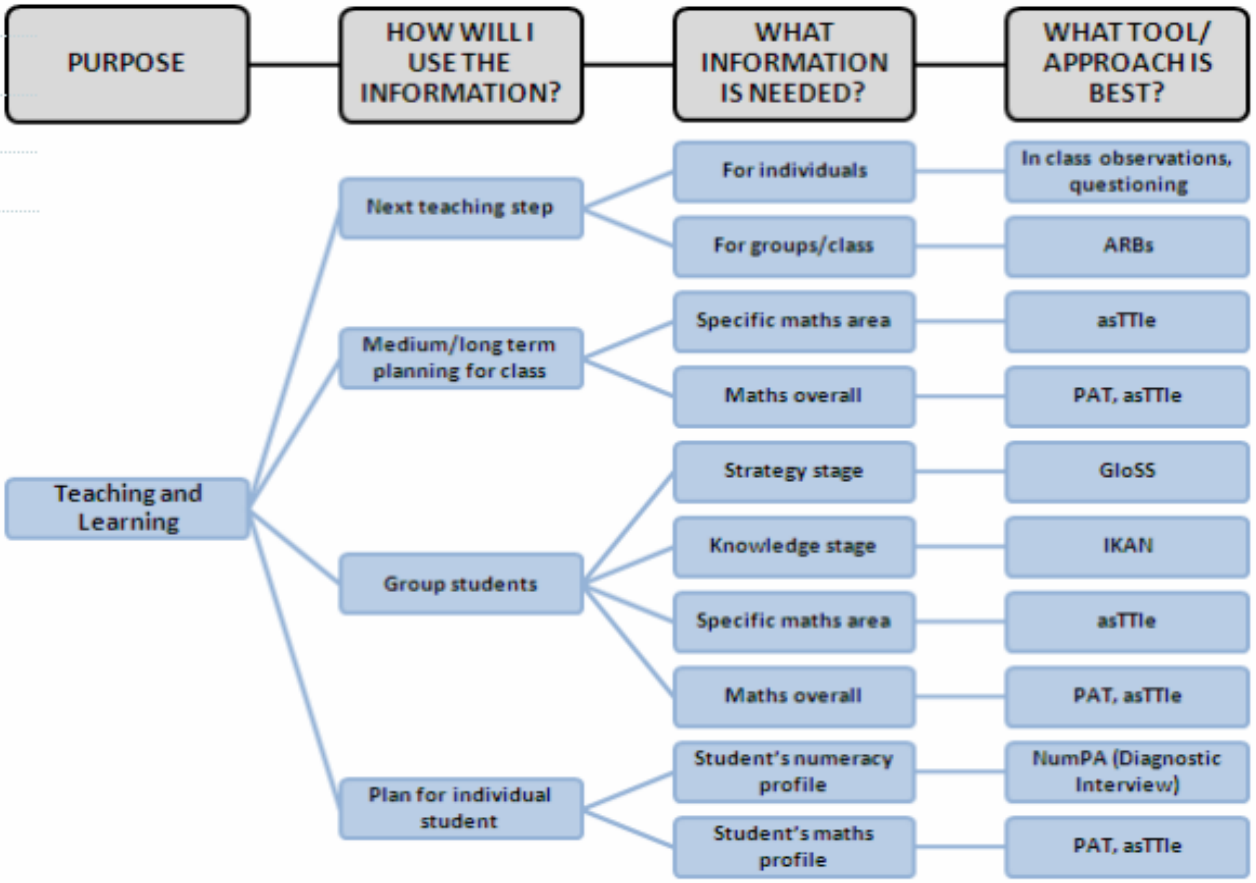
Beurteilung im Lernprozess

Nutzung von Instrumenten zur formativen Beurteilung

Gruppenbildung zur Differenzierung
Auswahl Fördermaterial

Schule





Numeracy Project

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Kompetenzentwicklungsmodell

Selbsteinschätzung der Lernenden

Schule

NZMATHS new zealand maths

Numeracy Project

0	E	Emergent
1	1	One to one Counting
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8	AP	Advanced Proportional

E
CA
AC
EA
AA
AM
AP

Student Profile

Name:			
Advanced Multiplicative	**to**	**Advanced Proportional**	**Date achieved**
I am learning to ...			**I can ...**

Solve problems with fractions, ratios and proportions by:	Using common factors to multiply between and within ratios, e.g. 8:12 as ☐:21 as 8:12 = 2:3 (common factor of 4) so 2:3 = 14:21 (multiplying by 7).	
	Partitioning fractions and percentages, e.g. 85% of 36 = ☐ as 10% of 36 = 3.6, 5% of 36 = 1.8, so 36 – 3.6 – 1.8 = 30.6.	

Kompetenzentwicklungsmodell

- Erfassung von Lernfortschritt
- Dokumentation von Lehrerfolg
- Rückmeldung von Lernstand und Lernfortschritt an Lernende und Eltern
- Evaluation auf Schulebene

Schule

0	E	Emergent
1	1	One to one Counting
2	CAM	Counting from One on Materials
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4	AC	Advanced Counting
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7	AM	Advanced Multiplication
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Year/Stage	E	1-1	CAM	CAI	AC	EA	AA
2004	3	2	13	5	0	0	0
2005	0	2	0	6	14	1	0
2006	0	0	2	0	13	7	1

End of Year Two Curriculum Expectations

Curriculum - Level 1					Level 2	Level 3	Level 4	Level 5
Stage 0 Em	Stage 1 1-1	Stage 2 CA	Stage 3 CAI	Stage 4 AC	Stage 5 EA	Stage 6 AA	Stage 7 AM	Stage 8 AP
1%	2%	9%	15%	56%	17%	1%	0%	0%

Longitudinal Study

At Risk

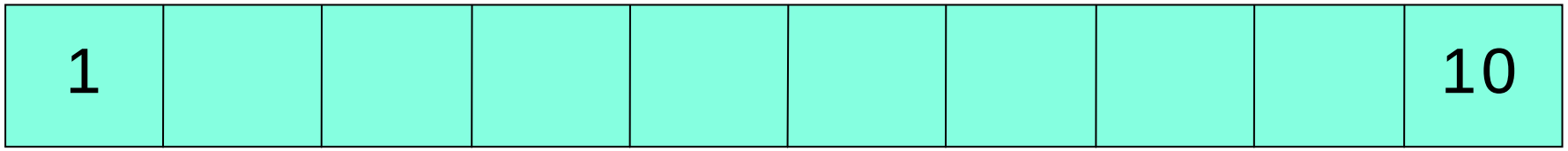
Cause for Concern

Achieving at or above expectations

High Achievers

Steuerung

Einstufung der Schulen in Dezile



0 % 10 % 100 %

- Maß für den Anteil an Lernenden aus „low socio-economic communities“
- Je niedriger der Sozialindex, um so höher ist die Finanzierung für die Schule durch die Regierung und um so höher ist das Gehalt des Schulleiters
- Finanzierung der Schulen

  Grundbetrag pro Schüler:

  $700 (Grundschule) bis $1000 (Jahre 11-13))

  Dezil-abhängiger Betrag pro Schüler:

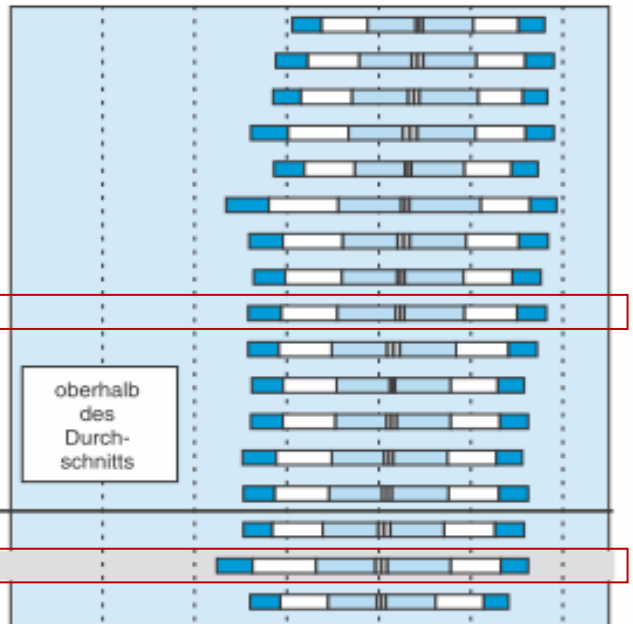
  $800 in Dezil 1 bis $0 Dezil 10

  Weitere Beträge geringerer Größenordnung

PISA

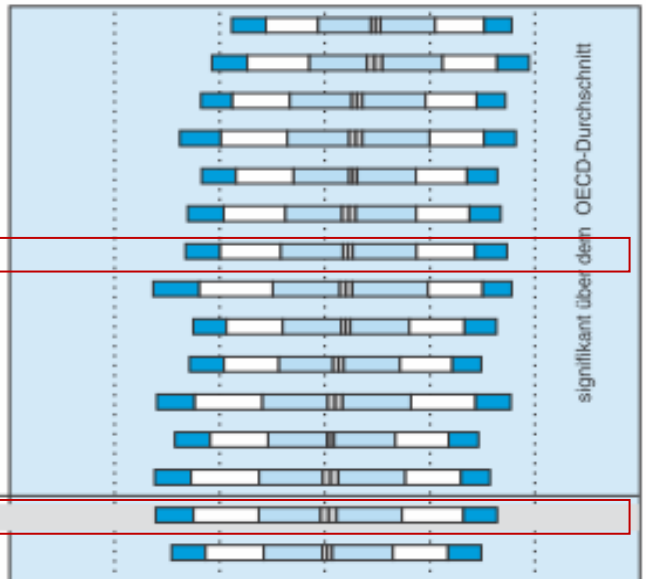
Pisa 2003

Staat	MW	SD
Finnland	544	84
Korea	542	92
Niederlande	538	93
Japan	534	101
Kanada	532	87
Belgien	529	110
Schweiz	527	98
Australien	524	95
Neuseeland	523	98
Tschechische Republik	516	96
Island	515	90
Dänemark	514	91
Frankreich	511	92
Schweden	509	95
Österreich	506	93
Deutschland	503	103
Irland	503	85



Pisa 2006

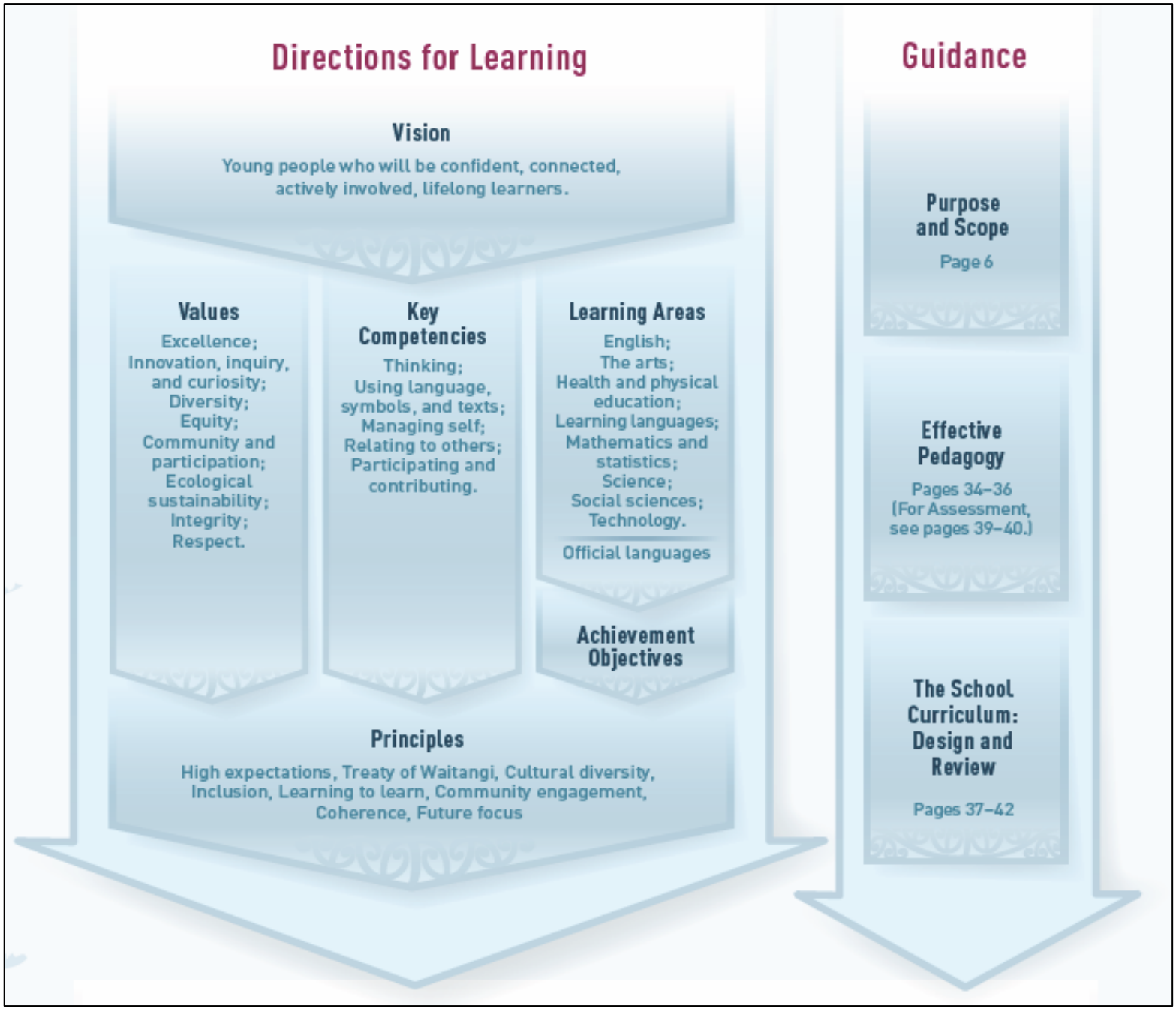
Staat	*M*	(*SE*)
Finnland	548	(2.3)
Korea	547	(3.8)
Niederlande	531	(2.6)
Schweiz	530	(3.2)
Kanada	527	(2.0)
Japan	523	(3.3)
Neuseeland	522	(2.4)
Belgien	520	(3.0)
Australien	520	(2.2)
Dänemark	513	(2.6)
Tschechische Republik	510	(3.6)
Island	506	(1.8)
Österreich	505	(3.7)
Deutschland	504	(3.9)
Schweden	502	(2.4)



Curriculum

The New Zealand Curriculum

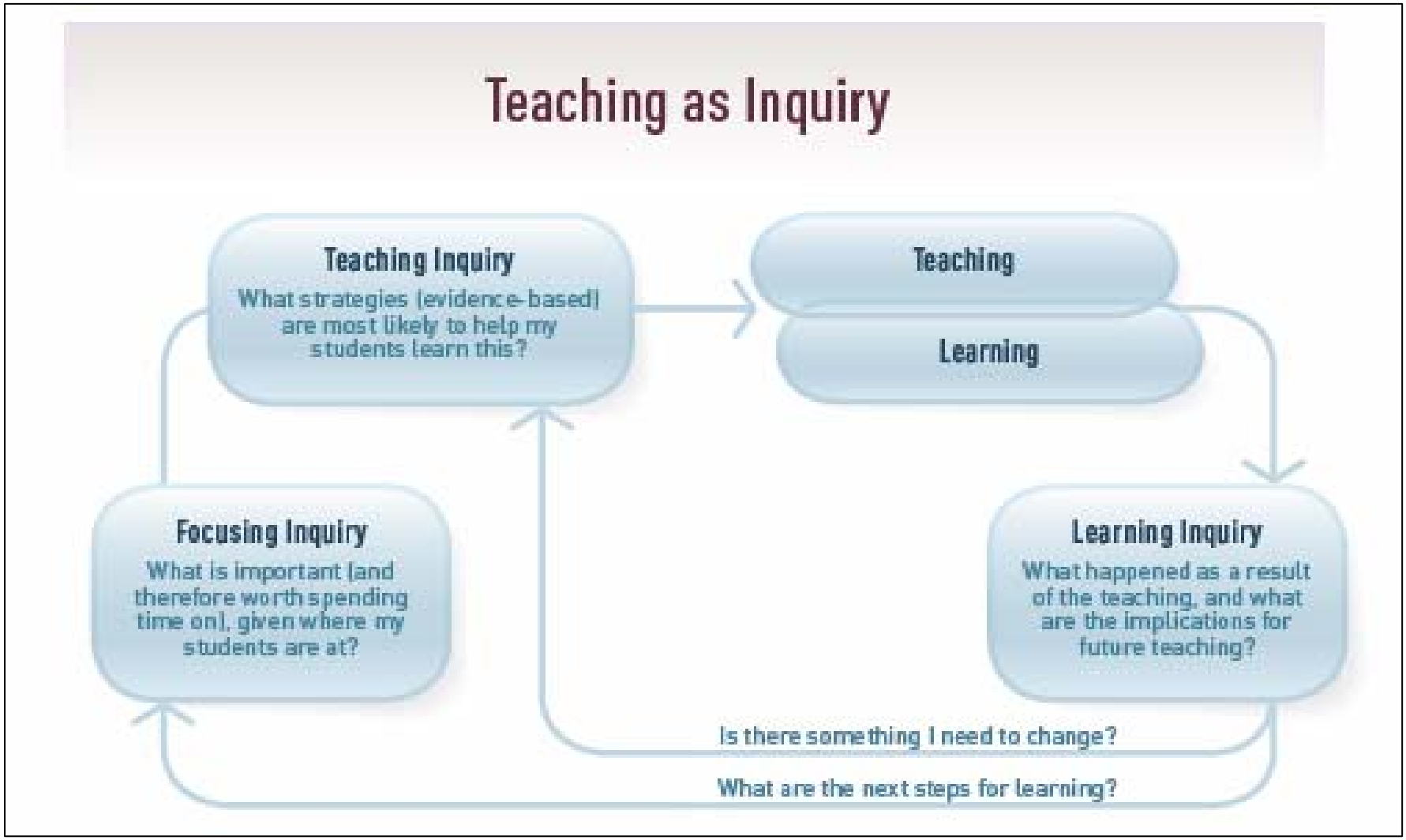
Curriculum



The New Zealand Curriculum

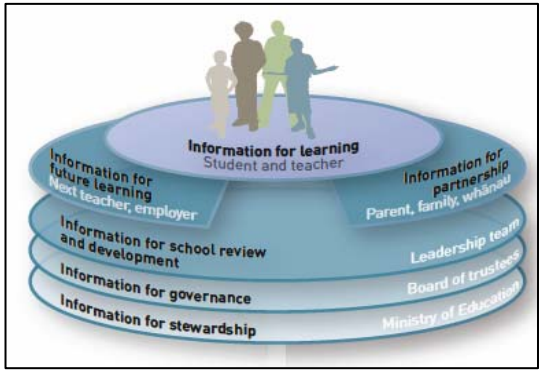
Curriculum

The New Zealand Curriculum



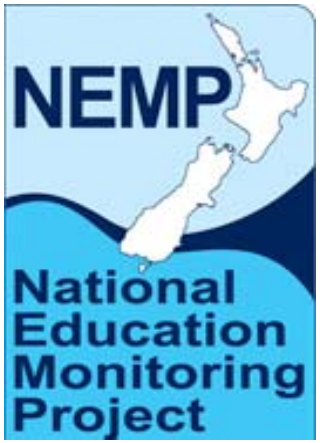
Assessment

PURPOSE	HOW WILL I USE THE INFORMATION?	WHAT INFORMATION IS NEEDED?	WHAT TOOL/ APPROACH IS BEST?
Teaching and Learning	Next teaching step	For individuals	In class observations, questioning
		For groups/class	ARBs
	Medium/long term planning for class	Specific maths area	asTTle
		Maths overall	PAT, asTTle
	Group students	Strategy stage	GloSS
		Knowledge stage	IKAN
		Specific maths area	asTTle
		Maths overall	PAT, asTTle
	Plan for individual student	Student's numeracy profile	NumPA (Diagnostic Interview)
		Student's maths profile	PAT, asTTle
Accountability and Reporting	Board of Trustees	Numeracy	GloSS, IKAN
		Other maths area	PAT, asTTle
	Families	School reports, interviews	asTTle, ARBs, PAT, GloSS, IKAN
	Students	Feedback provided to students on a specific area	GloSS, IKAN, ARBs, exemplars
Student self monitoring	Enable students to monitor progress and set goals	Progress on specific area	Learning intentions provided



Assessment

National Educational Monitoring Project

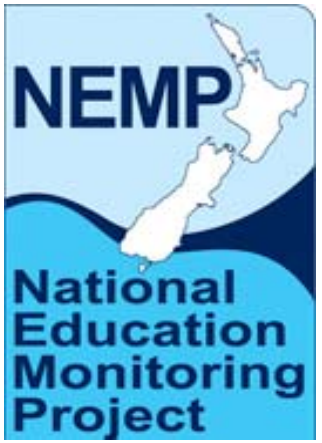


Educational Assessment Research Unit
of the University of Otago
(Prof. Crooks, Prof. Smith)

- Alle Fächer des Curriculums in Zyklen von 4 Jahren (seit 1995, in Maori seit 1999)
- Wissen, Fähigkeiten, Motivation und Einstellungen
- 3000 Sch. der Jahrgänge 4 und 8 aus 260 Schulen
- Testleitung: 100 Lehrkräfte pro Jahr
  (Freistellung für 5 Wochen)
  6 -7 % aller Lehrkräfte in 14 Jahren

Assessment

National Educational Monitoring Project



Testformate

- 1 – 1: Einzelarbeit mit Testleiter (Videoaufnahme)
- Einzelarbeit (Paper-and-pencil)
- Stationen: Vier Lernende arbeiten unabhängig an mehreren Stationen
- Gruppenarbeit
  Vier Lernende in Gruppenarbeit (Videoaufnahme)

Standards

2010: Einführung nationaler Standards
Lesen, Schreiben, Mathematik

- Orientierung am Curriculum
- Illustrierende Aufgaben und Schülerlösungen
- Overall Teacher Judgement
- Berichtspflicht der Schule (above, at, below, well below standard)
- Keine nationalen Tests
- Verantwortung der Lehrkräfte
- Schulübergreifende Vergleichbarkeit über Moderation
- Verpflichtende Fortbildungen
- Nationale Programme zur Unterstützung von Schulen

Standards

2010: Einführung nationaler Standards
Lesen, Schreiben, Mathematik

At least one of the written reports each year should include:

- the student's current learning goals;
- the student's achievement and progress in relation to the National Standards;
- what the school will do to support the student's learning;
- what parents, family, and whānau can do to support their child's learning.

Standards

Stellungnahme von Bildungsforschern

Terry Crooks, Charles Darr, Alison Gilmore, Cedric Hall, Kohn Hattie, Jeff Smith, Lisa Smith (März 2009)

Towards Defining, Assessing and Reporting Against National Standards for Literacy and Numeracy in New Zealand

Key Principles

3. Minimise negative impacts of the strategy on students‘ learning and educational experiences. …

   Rather than there being an overemphasis on tests, there needs to be an emphasis on students, teachers and parents appropiately interpreting information about students progress.