

Progress Maps

ASSESSMENT RESOURCE KIT

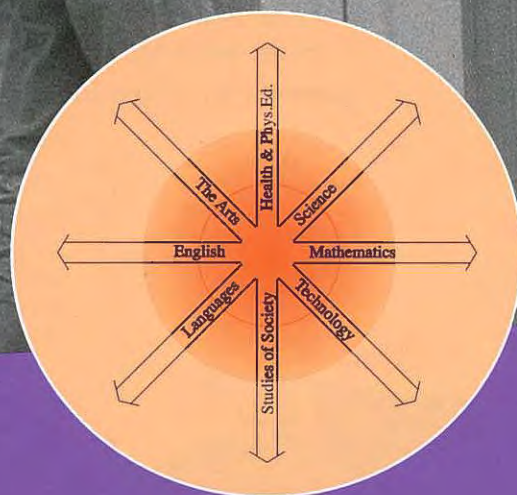
Portfolios
Performances
Projects
Products
Paper & Pen

Drafting a Map

Revising a Map

Enriching a Map

Setting Benchmarks



ISBN 0-86431-205-9



ARK

Geoff Masters & Margaret Forster



First published 1996
by The Australian Council for
Educational Research Ltd.
19 Prospect Hill Road, Camberwell,
Melbourne, Victoria 3124, Australia.

Copyright © 1996 Commonwealth of
Australia.

All rights reserved. Except as provided for by
Australian copyright law, no part
of this book may be reproduced without
written permission from the publisher.

This project was supported by a Grant under
the Curriculum Development Projects
Program from the Commonwealth
Department of Employment, Education,
Training and Youth Affairs. The views
expressed here are those of the authors and
do not necessarily represent the views of the
Department.

ISBN 0 86431 205 9

Edited by Eve Recht
Designed by Benjamin Forster

Printed by Allanby Press Printers Pty. Ltd.

Photographs courtesy of Outer Eastern TAFE,
Methodist Ladies' College and Wendy Bodley.

1 what is a progress map?

A progress map describes the nature of development in an area of learning and so provides a frame of reference for monitoring individual progress. An essential feature of a progress map is that it describes and illustrates developing competence.

13 drafting a progress map

The first step in constructing a progress map is to specify the kinds of skills, knowledge and understandings that make up a domain of learning and to draw on expert knowledge and research evidence to develop a draft of the sequence in which these learning outcomes typically develop.

33 revising a progress map

Once a progress map has been drafted the resulting draft must be checked against actual student achievements. This checking process usually leads to revisions of a map.

43 enriching a progress map

Observations of students' performances on assigned tasks provide opportunities to elaborate and refine descriptions of typical progress through an area of learning. This process of filling gaps and adding detail enriches the definition of the learning area construct.

49 setting benchmarks

A benchmark is a point of reference for interpreting student achievements. Comparative benchmarks are set by reference to performances in other places. Absolute benchmarks are set by identifying desirable levels of performance for particular purposes.



what is a progress map?

A progress map describes the nature of development in an area of learning and so provides a frame of reference for monitoring individual growth.

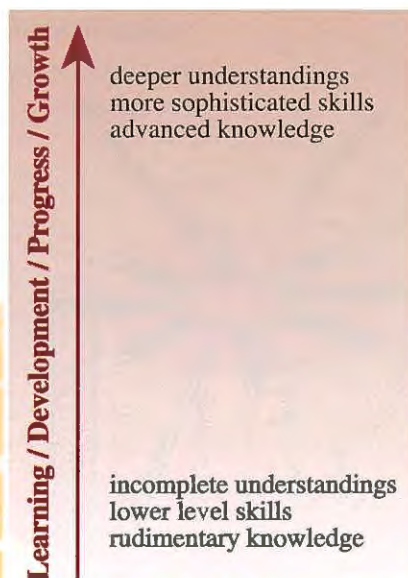
The concept of individual progress—or growth, development, or improvement—is a fundamental idea in all teaching and learning. This concept is invoked whenever teachers describe students as becoming better readers, using more sophisticated language, becoming more tolerant of others, developing deeper understandings, acquiring higher-order skills, solving more difficult problems, or mastering more advanced knowledge. Teachers use words such as ‘better’, ‘deeper’, ‘higher’ and ‘more’ to describe the direction of student progress in particular areas of learning.

Programs and curricula in schools are designed to support and encourage student development on many different dimensions. School programs, at least in

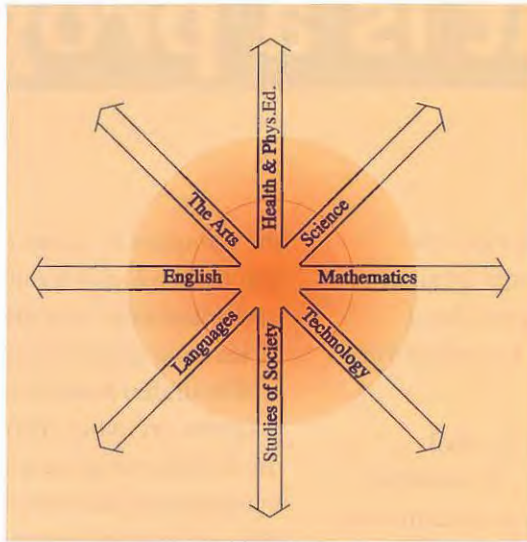
the compulsory years of school, aim to develop students’ skills and understandings in a diverse range of learning areas. An academically well-rounded student makes progress on many fronts, including the key learning areas of English, mathematics, sciences, health and physical education, studies of society and the environment, languages other than English, technology, and the arts.

But schools’ concerns are not limited to the academic development of students. Schools also seek to promote growth in personal and social skills such as leadership, the ability to work as a member of a team, self-confidence, empathy, self-motivation, and independence. These aspects of student development are not specific to particular learning areas but are best thought of as general, cross-curricular skills or attributes.

The concept of individual development is a central idea in all teaching and learning.



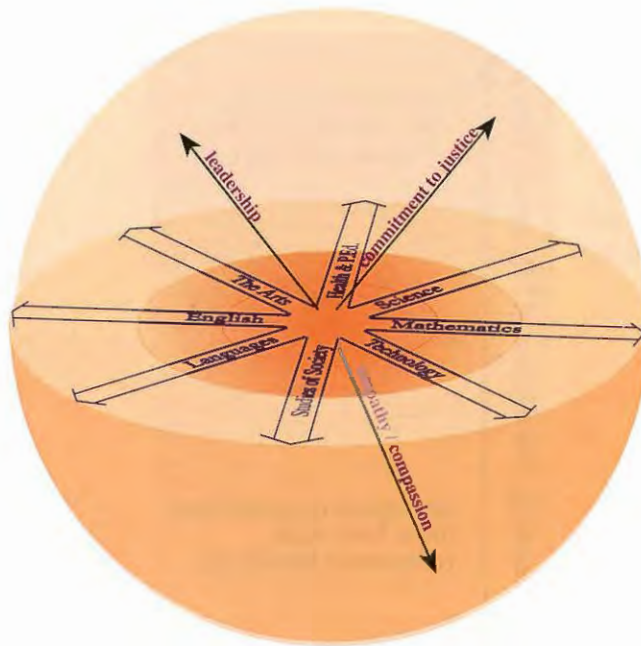
A progress map describes the direction of student growth.



A well-rounded student makes progress on many fronts simultaneously.

Student development is thus *multidimensional*: students make progress on many dimensions simultaneously. However, when it comes to assessing and monitoring a student's development, it is usual—and probably necessary—to focus attention on *one* aspect of development at a time.

This notion of focusing attention on one aspect at a time is a familiar idea when monitoring a child's physical development or health. In these contexts, attention is focused on particular variables (height, weight, temperature, blood pressure, heart rate, etc.) and separate measures are made on



Schools also seek to promote growth on a variety of personal and social dimensions.

each. These measures might subsequently be brought together to make global evaluations of a child's physical progress or state of health, but each contributing measure is made by focusing attention narrowly on just *one* variable at a time.

In a similar way, teachers monitor student development by focusing assessments on one area of learning at a time. A decision might be made to focus on progress in mathematics, for example, or perhaps more narrowly on a student's level of achievement in number, measurement, space, chance and data, or algebra. In monitoring developing competence in English, separate assessments might be made in the areas of reading, speaking, listening, writing, and viewing.

Although teachers monitor development by focusing on one dimension at a time, it is sometimes possible to use the same classroom task or activity as a source of evidence about more than one achievement dimension. An extended mathematics problem solving task, for example, might be used as a source of evidence not only about achievement in mathematics, but also about achievement in reading, writing, or working as a member of a team.

the intention In developmental assessment (see also *ARK Developmental Assessment*), the intention is to focus attention narrowly on one area or domain of learning and to construct a 'progress map' as a frame of reference for estimating students' levels of achievement and for monitoring individual progress through that area of learning.

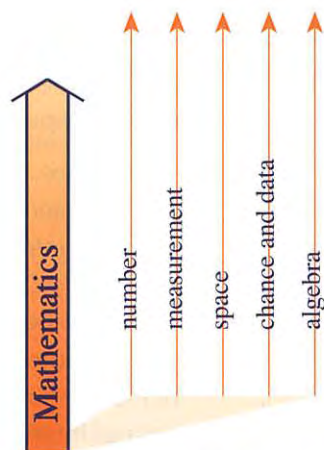
A decision might be made, for example, to focus attention on 'reading' and to assess individuals' levels of achievement in reading. This intention raises a number of questions: Is the idea that children differ in their levels of reading achievement a useful idea? Is this idea supported by assembled evidence (observations of reading behaviour)? Is the idea too simplistic: Is reading too complex to allow a single measure of each student's reading achievement? Do students' reading abilities vary across text types, for example, meaning that reading should be further subdivided and separate reading measures reported for different kinds of texts (e.g. fiction and non-fiction)?

The measurement of any object or entity describes only *one* attribute of the object measured. This is a universal characteristic of all measurement. When the height of a table is measured, the whole table has not been described but only that attribute which has been measured.¹

Thurstone, 1931

Assessment which provides details of achievement in different aspects of a subject is more valuable than a single overall grade.²

Paul Black



Student progress often is monitored separately in different areas (strands) of a learning area.

A progress map describes and illustrates developing competence.

In the case of reading, numerous studies over many years have failed to identify a generally useful way of subdividing this area of learning. Observations of student performance seem most consistent with the simple idea that, at any given time, each student has a level of reading ability independent of text type. For this reason, most progress maps constructed for reading, and most assessments of reading achievement, treat reading as a single domain.

Nevertheless, every attempt to define an area or domain of learning and to construct a progress map for that domain must be accompanied by an analysis of the extent to which student performances are consistent with this intention. Is the evidence consistent with the idea that, at any given time, individuals have measurable levels of achievement within the described area of learning?

Once a progress map has been constructed, the intention is to estimate students' levels of achievement from records of their perfor-

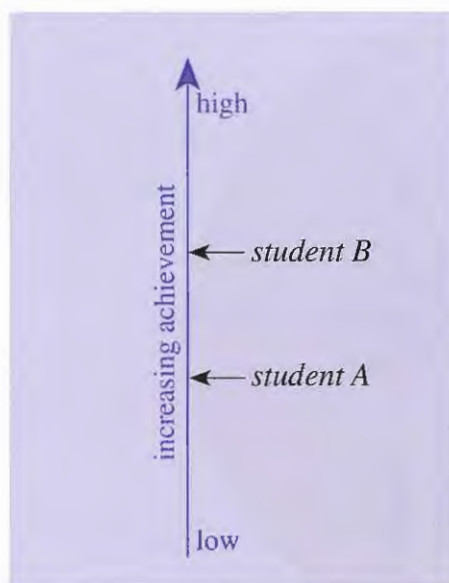
mances and work. This process of estimating a student's level of achievement on a progress map always involves a weighing of the available evidence to make an on-balance estimate (sometimes described as an estimate of 'best fit' to the evidence). And, because it is an estimate, there is always a degree of uncertainty associated with a student's estimated location on a progress map.

describing progress

An essential feature of a progress map is that it describes developing competence in words and examples. A progress map describes the knowledge, skills and understandings of a learning area in the sequence in which they typically develop and provides examples of the kinds of performances and student work typically observed at particular levels of attainment.

The knowledge, skills and understandings that make up a domain of learning and which are described along a progress map are sometimes called 'outcomes', 'descriptors', or 'indicators'. Outcomes are broadly-described student behaviours or sets of behaviours. An outcome in physics, for example, might be to 'define common forces using mathematical expressions and diagrams'. An outcome in English might be to 'identify simple symbolic meanings and stereotypes in texts and discuss their purpose and meaning'.

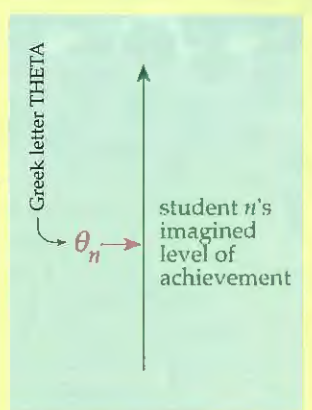
Outcomes are accompanied by specific examples—sometimes called 'pointers'—which illustrate and clarify the scope of each outcome. A specific example of this physics outcome might be to identify and estimate the forces acting on a golf ball at the time it is struck, given the ball's mass and estimated acceleration on impact



Is the evidence consistent with the idea that individuals have measurable levels of achievement within the area of learning?

progress maps as inventions

Every progress map begins in the imagination as an attempt to deal with the complexity and multidimensionality of student development. A progress map is a construction. It focuses attention on a particular area of learning and proposes that, within that area, individuals have levels of achievement which can never be known exactly, but which can be estimated. Students' imagined levels of achievement are sometimes labelled with the Greek letter theta (θ).



(using the equation $F=ma$) and to draw a diagram showing the forces acting on the ball and golf club at the time of impact. Specific examples of this kind together clarify what is meant by 'common' forces and illustrate the kinds of 'mathematical expressions' and 'diagrams' referred to in the outcome.

There are many possible examples of an outcome. In general, these examples are not equivalent. Some 'common' forces referred to in this physics outcome are likely to be less familiar to students than others. Some mathematical expressions and diagrams may require higher levels of understanding than

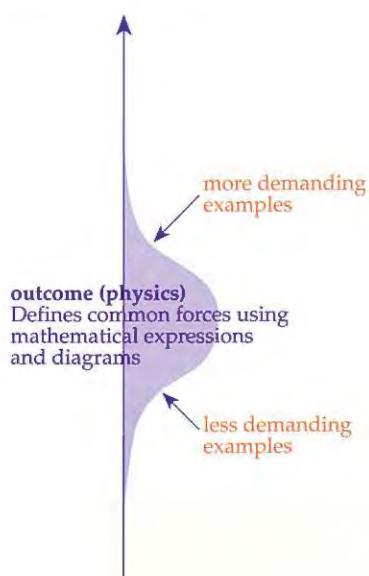
others. Some contexts for defining forces will be more difficult than others. In general, an outcome is probably best conceptualised not as a point location on a progress map, but as a distribution of examples or manifestations of the outcome over a range of locations.

Locations along a progress map can be further illustrated with samples of student work, sometimes referred to as 'exemplars' or 'work samples'.

Selected outcomes on the Writing strand of the English profile for Australian schools are shown on page 6. These outcomes, all of which relate to linguistic structures and features of student writing, are accompanied by examples of the kinds of features typically observed in student writing at these levels³

A collection of student work samples could be used to further elucidate the levels described here. An example of such a work sample is shown on page 7. This piece of writing illustrates achievement at about Level 3, both in terms of its content and in terms of its linguistic structures and features.⁴ The sample has been annotated to draw attention to features of the writing that place it at about Level 3.

Levels of achievement on a progress map can be illustrated with student work samples.



Specific examples of an outcome usually are distributed over a range of locations on a progress map.



Writing (linguistic structures and features)

5

Controls the linguistic structures and features necessary to communicate ideas and information clearly in written texts of some length and complexity.
(Examples: uses suitable headings and subheadings in sustained informational text such as projects and assignments; uses paragraphs to indicate a sequence of ideas in informational and narrative texts; controls cause and effect sequences in narratives so that reader is clear about what is happening and why; controls tenses and subject-verb and noun-pronoun agreement)

4

Controls most distinguishing linguistic structures and features of basic text types such as stories, procedures, reports and arguments.
(Examples: adopts organisational conventions when given a structured format for writing a particular type of text; recognises meaningful divisions between sections of text and sets these out as paragraphs; uses a range of conjunctions to indicate relationships between ideas in writing; consistently uses most common punctuation marks)

3

Controls most basic features of written language and experiments with some organisational and linguistic features of different text types.
(Examples: controls basic sentence structure and attempts to vary sentence beginnings and clause structures; spells many common words correctly in own writing; writes legibly on most occasions; uses some conventions of layout; uses time order to organise writing of recounts and stories; uses correct tense for text type; writes with clearly discernible beginnings, middles and ends)

2

Uses some basic linguistic structures and features of written language so that writing can be readily interpreted by others.
(Examples: always writes from top to bottom, left to right, and leaves spaces between words; usually uses correct word order in sentences; links ideas in writing by using pronouns to refer to preceding nouns, links ideas using 'and' and 'then', and sometimes 'because' or 'but'; uses some punctuation markers correctly such as capital letters to begin names; spells some common words accurately; forms most letters of the alphabet correctly)

Once I had to look after my
 little cousin Chantle. Chantle
 not do anything you tell her
 to do. Chantle would not go
 to bed when I told her Chantle
 would just start crying. Then
 Chantle would run around the
 house with no clothes on.
 Chantle finally went to sleep at
 11:30 eleven thirty at night.
 The next day Chantle woke up at
 7:00 seven fifteen in the morning.
 We played all day long (Chantle)
 Howard (I was minding Chantle for a week).
 We went to for a walk down The Old
 Townsipa Road. It had a beautiful
 scenery with tulips, roses, blah blahs,
 tree in the back ground and weeds. We walk
 back for lunch and we had a
 great week.

correct spelling of many common words

control of simple sentence structure

character named but not well defined

sequence of events but little evidence of selection and control

shape to the piece - clear beginning and end

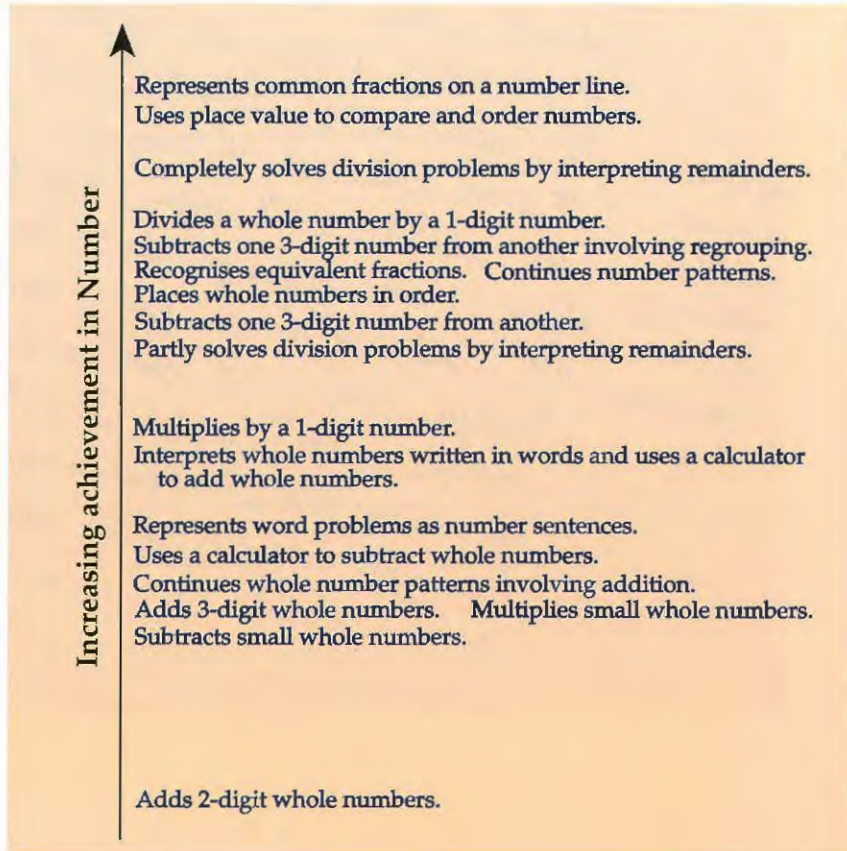
marking out a progress map

A progress map is a picture of the path of typical student progress through an area of learning. Every progress map begins with the idea of progression: the idea of a continuum of developing skills, knowledge and understandings in some defined area of learning.

A number of approaches can be taken to mark out and communicate locations on a progress map. Three approaches are described here: calibrating behaviours, dividing a continuum into levels, and adding numerical scales. These systems for referring to positions along a map are designed to make it easier to record individuals' levels of achievement and to monitor their progress through an area of learning.

calibrating behaviours

One approach to marking out a progress map is to 'calibrate' the underlying continuum with observable student behaviours. This approach is illustrated below where a continuum of increasing achievement in Number has been marked out in terms of the skills and behaviours typically demonstrated by students at varying locations along this map. These descriptions and their locations are based on the performances of students on the Queensland Year 6 numeracy test.⁵ The Number skills most often demonstrated by Queensland Year 6 students are at the bottom of the map; the skills least often demonstrated are at the top. The statistical technique used to calibrate a continuum in this way is known as item response modelling.⁶



Descriptions of items from the Number strand of the Queensland Year 6 Test calibrated along a continuum of increasing achievement in Number.



Some progress maps (shown here in Reading) assign labels to achievement levels.

There is no limit to the number of test items which could be developed and calibrated along a progress map. Each new item added to a map, and the accompanying description of the skill or understanding it requires, adds detail and enriches the overall picture of development in the learning area. When meaning is added to a map in this way, students' estimated levels of achievement (locations on the map) can be interpreted in terms of the kinds of skills and behaviours typical of students at those levels.

dividing into levels

A progress map or continuum is sometimes divided into stages, phases or levels of achievement. These levels make it easier to think about and to describe progress through a learning area, but the number of levels into which a continuum is divided is always somewhat arbitrary (in much the same way that local government regions on a map are somewhat arbitrary but convenient constructions).

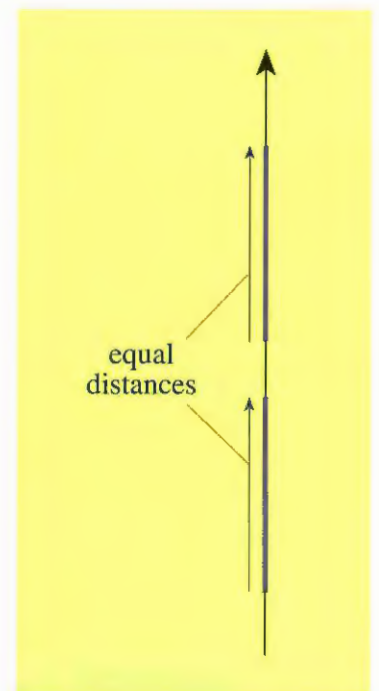
These levels are sometimes numbered. For example, in the Australian profiles, levels along each achievement strand are labelled 'Level 1' to 'Level 8' (see the described levels on the Writing strand on page 6).

On other achievement continua, levels are given verbal labels. Phases of the First Steps developmental continua, for example, are assigned labels such as 'Role Play', 'Experimental' and 'Early Reading' in an attempt to summarise in one or two words the kinds of observations typically made in each phase.⁷

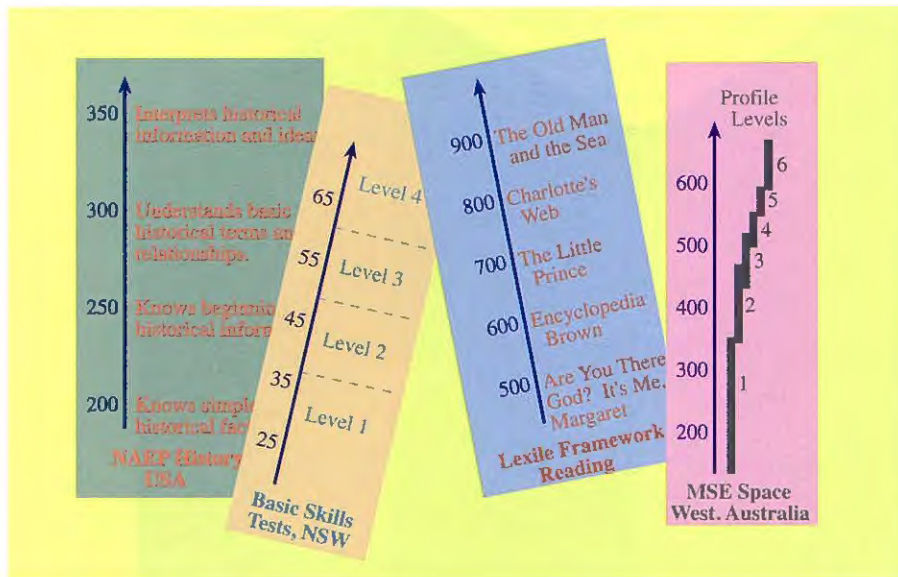
adding numerical scales

If a progress map is to be used to monitor and compare amounts or rates of growth then, ideally, equal distances on the map should represent equal increases in achievement.

The idea that equal distances on a map should represent equal amounts is a central idea in the 'measurement' of attributes. In the measurement of temperature, for example, scales are constructed so



Equal distances on a progress map should represent the same amount of growth.



Many different numerical scales are used to mark out progress maps. The scales shown here are from NAEP History assessments⁹, the New South Wales Basic Skills Tests¹⁰, The Lexile Framework for Reading¹¹, and the Western Australian Monitoring Standards in Education program.¹²

A unit of measurement is always a process of some kind that can be repeated without modification in the different parts of the measurement continuum.⁸
Thurstone, 1931

that the difference between 10 and 20 degrees represents the same temperature change as the difference between 80 and 90 degrees.

The key to constructing maps with equal intervals is the invention of *units* which can be used to mark out equal amounts of the attribute being measured.

Progress maps for monitoring educational achievement can be marked out in equal intervals using the statistical technique known as item response modelling. This technique defines a unit of measurement. Many common progress maps, including those shown above and some on page 9, are constructed

using item response models to ensure that equal distances along each map represent equal amounts of student growth.

Once a progress map has been constructed so that equal distances represent equal increases in achievement, it is possible to use any convenient numerical scale to indicate positions along that map. Just as different numerical scales can be used to mark locations along a temperature continuum (with the same temperature being assigned 0 on the Celsius scale, 32 on the Fahrenheit scale, and 273 on the Kelvin scale), any convenient numerical scale can be used to mark out a progress map.

what a progress map is not

A progress map is:

NOT a description of the path that all students follow as they learn

Students follow different paths as they progress through an area of learning. Perhaps no two students learn in exactly the same way. Despite this, it often is possible to identify the path that students typically follow as they learn. A progress map describes this path of typical progress and as such can be a useful frame of reference for studying the idiosyncratic development patterns of individuals.

NOT a prescription for a learning sequence

Although a progress map may be useful in estimating students' current levels of achievement and for making decisions about appropriate kinds of learning activities for individuals, a progress map does not specify a sequence of learning activities.

NOT based on the assumption that a student will demonstrate all skills, understandings and knowledge below their estimated level of achievement

On a progress map it is likely that a student will demonstrate most, but not all, skills, understandings and knowledge from levels below their estimated level of attainment, and some skills, understandings and knowledge from levels above their estimated level of attainment.

NOT based on any single theory of learning

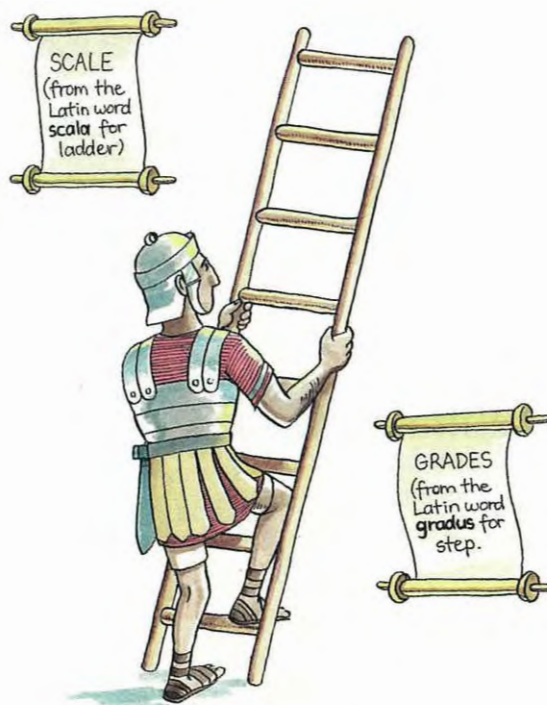
Although a progress map should be informed by learning theory, progress maps do not all reflect a single theory of learning. A map may be based on the pragmatic observation that it is possible to identify a path of typical progress through an area of learning.

NOT a description of 'natural' sequences of development only

A progress map is the result both of 'natural' sequences of student development and common conventions for the content and delivery of curricula, and may be elucidated by systematic research into student learning.



- 1 Thurstone, L.L. (1931) 'Measurement of social attitudes', *Journal of Abnormal and Social Psychology*, Vol. 26, pp. 249-269.
- 2 Black, P. (1987) *Report of Task Group on Assessment and Testing* London: Department of Education and Science, para. 7.
- 3 Curriculum Corporation (1994) *English – A Curriculum Profile for Australian Schools*, Carlton: Curriculum Corporation.
- 4 Forster, M, Mendelovits, J. & Masters, G.N. (1994) *Developmental Assessment Resource for Teachers: English*, Melbourne: Australian Council for Educational Research.
- 5 Queensland Department of Education (1995) *Queensland Year 6 Test*, Brisbane: Department of Education.
- 6 van der Linden, W. & Hambleton, R. (1996) *Handbook of Modern Item Response Theory*, New York: Springer-Verlag.
- 7 Western Australian Ministry of Education (1991) *First Steps Spelling Developmental Continuum*, Perth, W.A.: Ministry of Education.
- 8 Thurstone, pp. 249-269.
- 9 Educational Testing Service (1990) *The U.S. History Report Card*, Office of Educational Research and Improvement, U.S. Department of Education.
- 10 Masters, G.N., Lokan, J., Doig, B., Khoo, S-T, Lindsey, J., Robinson, L. & Zammit, S. (1990) *Profiles of Learning: The Basic Skills Testing Program in New South Wales*, Melbourne: Australian Council for Educational Research.
- 11 Stenner, J. (1996) Measuring reading comprehension with the lexile framework. Paper presented at the Fourth North American Conference on Adolescent/Adult Literacy, Washington, DC.
- 12 Titmanis, P, Murphy, F, Cook, J, Brady, K. & Brown, M. (1993) *Profiles of Student Achievement: Results of the 1992 Monitoring Standards in Education Program*, Perth, W.A.: Ministry of Education.



drafting a progress map

The first step in constructing a progress map is to specify the kinds of skills, knowledge and understandings that make up a domain of learning and to develop a draft of the sequence in which these learning outcomes typically develop.

There are two general approaches to drafting a map.

'top-down' drafts

The first approach, referred to here as the top-down approach, is to ask teachers and subject matter specialists to use their professional knowledge to develop a picture of the sequence in which the knowledge, skills and understandings of a learning area typically develop. The draft that results from this approach is based on expert knowledge and opinion.

'Top-down' approaches to drafting progress maps are illustrated on pages 14 to 27. Each of the maps on these pages was developed by a team of curriculum specialists as a framework for monitoring student progress through an area of learning.

Progress maps developed using top-down approaches are described here as 'drafts' because they are based on teachers' and curriculum specialists' expert knowledge, but need to be tested, refined and enriched using actual student performances.

'bottom-up' drafts

The second approach to constructing a progress map, the bottom-up approach, uses only observations of student responses to develop a picture of increasing knowledge, skills and understandings. The draft that results from this approach is constructed from an analysis of recorded observations and judgements of actual student work.

'Bottom-up' approaches to drafting progress maps are illustrated on pages 28 to 31. Each of these maps was constructed from an analysis of students' performances on a limited set of assigned tasks.

Progress maps developed using bottom-up approaches are described here as 'drafts' because they usually are based on a small set of assigned tasks—perhaps a single test or a few linked tests—and need to be refined, enriched and generalised by reference to a much larger bank of tasks and student work samples.

Teachers sometimes find it useful to add their own detail to a progress map, drawing on classroom experience to fill gaps in a map and to provide examples better suited to particular student populations (see examples on page 23).

There are two general approaches to drafting a map.



Australian Curriculum Profiles

The progress maps constructed collaboratively by all Australian States, Territories and the Commonwealth in the period 1989-93 are called 'profiles'. Profiles were developed for eight broad areas of school learning: English, mathematics, science, studies of society and the environment, technology, languages other than English, the arts, and health and physical education.

The first step in the construction of a profile was to develop a framework known as a 'statement' for curriculum development in each area of learning. The statement defines the learning area, outlines its essential elements, shows what is distinctive about the area, and describes a sequence for developing knowledge and skills.³

The *profile* in each learning area is then constructed as 'a framework for reporting student achievement'. It is divided into a number of 'strands'. These are the major organisers of the learning area. They can be groupings of content, process, and/or conceptual understanding.

In The Arts learning area, for example, five strands are identified corresponding to different arts forms: Dance, Drama, Media, Music, and Visual Arts. These five strands are further divided into three strand 'organisers': creating, making and presenting, arts criticism and aesthetics, and past and present contexts.

Along each profile strand, eight levels of achievement are defined. These levels describe progression in student learning. They provide a map of increasing achievement in the area.

Each level on a profile strand is defined by 'outcomes': descriptions of skills and knowledge that students typically acquire as they become more proficient in an area of learning.

The progress map on page 15 shows the first five levels on a progression of increasing achievement in creating, making and presenting dance. The italicised text at each level describes the kinds of student dance behaviours ('outcomes') characteristic of that level. The non-italicised text is a list of examples of specific behaviours illustrating achievement at that level.

In using this progress map to assess and report students' levels of dance achievement, teachers are encouraged to refer to a variety of evidence, including:

- work diaries or journals kept by students to record the generation and development of their ideas, refinement of techniques and skills, and planning for presentation;
- notated scores (graphic and traditional) for music and dance;
- video and tape recordings;
- folios of works and preparatory materials, experiments, ideas tried out;
- students' commentaries on their own works; and
- projects, researched essays, and computer-generated presentations.⁴

A profile is a vertical map of performance territory from lower to higher performance upon which a student's cumulative performance as assessed can be placed.¹

Garth Boomer

Profiles describe the progression of learning typically achieved by students during the compulsory years of schooling.²

Curriculum Corporation



Level 5: *Uses starting points such as observation, experiences and research to express ideas and feeling. Structures dance works by organising dance elements and applying appropriate skills, techniques and processes. Plans, selects and modifies presentations for particular occasions, taking into account factors such as purpose, space, materials and equipment.*

- creates dance sequences on abstract themes (e.g. geometric shapes);
- explains the theme, intention, ideas and images of dances;
- creates a short dance sequence demonstrating combinations of energy;
- develops a movement motif such as circling and rotation into a sequence;
- presents a dance sequence in a chosen dance style;
- performs a dance in contrasting performance environments.

Level 4: *Experiments with ideas and explores feelings to find satisfactory solutions to tasks. Selects, combines and manipulates dance elements using a range of skills, techniques and processes. Draws upon a range of skills to present dance works for a variety of audiences and purposes.*

- travels and freezes in a shape expressing an emotion or state (e.g. fear);
- links shapes and movements to create short dances that explore themes;
- demonstrates different types and styles of jumps (e.g. one foot to two);
- combines two changes at once (e.g. direction and speed);
- performs a dance so that the mood of the dance is communicated;
- presents a whole-class dance with consideration of audience reaction.

Level 3: *Explores ideas and feelings through dance works. Explores and uses several dance elements and uses specific skills, techniques and processes appropriate to dance. Plans and presents dance works for a particular audience and purpose.*

- indicates awareness of other dancers in the group;
- combines voice with movement to express ideas and feelings;
- demonstrates principles of postural alignment in their dancing;
- uses contrasting movements (travels at different speeds);
- performs a group dance for visitors to the school;
- performs combinations of movements focusing on particular body parts.

Level 2: *Uses experience and imagination to make dance. Makes choices about dance elements and organises them in expressive ways. Plans and presents dance works for a familiar audience.*

- interprets feelings/emotions through movement (happy jump, tired fall);
- explores movement in imaginary tactile environments (water, sand);
- learns several simple short dances;
- repeats short action sequences they have created (run, jump, roll);
- performs movements reflecting emotions (facial expressions, gestures);
- retells with movement simple rhymes, songs and stories.

Level 1: *Draws upon play and imagination in making dance. Uses basic elements of dance, such as space and time, and explores them in making dance works. Shares dance works with others.*

- moves freely while exploring movements (gliding, rolling, creeping);
- responds in movement to different feelings (tiredness, anger, joy);
- moves freely while travelling without bumping into others;
- imitates or shadows the movements of a leader;
- shows shapes and movements to others in their class;
- teaches a favourite movement to others in the group.

The Australian curriculum profiles include a progress map for assessing and monitoring achievement in creating, making and presenting dance.

Bainbridge Island Developmental Continua

The
Bainbridge
Island
School

District in Washington has developed progress maps known as 'reading and writing continua' as frameworks for monitoring student progress and reporting that progress to parents. Each continuum is divided into nine described 'stages'. The descriptions of the stages provide a common language for discussing reading and writing development.

Five levels of the Bainbridge Island writing continuum are shown on page 17. The text associated with each level describes the kinds of student writing behaviours typically observed at that level.

Each continuum was developed from teachers' experiences and intuitions, informed by research literature on language development and assessment, and then revised in the light of teachers' classroom observations.

The reading and writing continua provide the basis of a 'progress report' to Bainbridge Island parents. Teachers simply write the month and year on the continuum alongside the appropriate stage. 'The teachers intentionally did not place lines between the stages so that the date could be placed anywhere along the continuum.'⁸

The descriptors on the continuum are specific enough that teachers can be consistent and clear about the criteria for evaluation. Teachers, parents, and students now have a common language to use when talking about reading and writing development. In addition, the process of developing and revising the continuum became a vehicle for teachers to articulate and examine educational practices.⁹

The Bainbridge Island School District defines a continuum as:

a visual representation of literacy development using descriptors to depict the developmental stages of learning.

One reason for using a continuum was to emphasize that learning is a process and that the emphasis should be on progress, rather than on competition.⁵

By letting children know specific characteristics of each stage, they became more aware of their own growth, and can use the language from the continuum in their reflections.⁶

'What can most second graders do as readers by the end of the year?' 'What kinds of writing skills do most fourth graders demonstrate by June?' The teachers on Bainbridge Island met by grade level and began to talk about these and similar questions. Despite a wide range of experience and philosophy, the teachers could pinpoint common patterns for each age group. These benchmarks were then expanded into writing and reading continuums with specific descriptors for each developmental stage.⁷

Independent

Writes cohesive in-depth pieces; internalizes writing process; analyzes and evaluates written material in depth; perseveres through complex writing projects. These writers have internalized the writing process and persevere through extensive projects. These analytic writers may have their own distinctive style, but, through their evaluation of written material, their style continues to grow.

Proficient

Adapts style for a wide range of purposes; varies sentence complexity naturally; uses literary devices effectively; integrates information from a variety of sources to increase power of writing; uses sophisticated descriptive language; uses many revision strategies effectively. This level is sophisticated. These writers often deal with abstract and complex issues in their writing. They are prolific and versatile. These writers show great flexibility in moving between teacher-directed and self-directed topics.

Fluent

Uses appropriate tone and mood for a variety of purposes; experiments with complex sentence structure; connects paragraphs in logical sequence; uses an increased repertoire of literary devices; revises for clarity by adding reasons and examples; includes deleting in revision strategies; edits with greater precision (spelling, grammar, punctuation, capitalization). The writer attempts to vary sentence length and complexity. They also use transitions effectively, such as: however, and, but, and or.

Bridging

Begins to write for various purposes; begins to organize ideas in logical sequence; begins to develop paragraphs; begins to revise by adding literary devices; develops editing and proof reading skills; employs strategies to spell difficult words correctly. The writing is often uneven: the writer may focus on one aspect of a piece, but pay less attention to others. Students are learning that meaning can be made more precise through the use of details, reasons, and examples. Dialogues, similes, and alliteration are added, usually with guidance.

Expanding

Begins to consider audience; writes pieces with beginning, middle and end; revises by adding description and detail; listens to peers' writing and offers feedback; edits for punctuation and spelling; uses capital letters and periods; forms letters with ease; spells many common words correctly, however, inconsistencies frequently occur. Students adapt the tone to suit the audience. Editing skills continue to grow, though are still fairly inconsistent.

The Bainbridge Island Reading and Writing Continua include a progress map for assessing and monitoring achievement in writing.

National Curriculum Assessment, England and Wales

The national curriculum in England and Wales provides progress maps against which students' achievements can

be assessed and reported. The principles underlying the British progress maps were established in the 1980s by a national Task Group chaired by Professor Paul Black.

The Task Group proposed that each learning area be divided into a number of strands or profile components:

- the profile components identify the main areas of attainment within which progression is to be assessed.

For each strand, the Black Committee proposed a sequence of levels:

- we shall use the word level to define one of a sequence of points on a scale to be used in describing the progress of attainment. The sequence of levels represents the stages of progression.¹²

The national Task Group recommended that subject working groups 'define a sequence of levels in each of its profile components, related to broad criteria for progression in that component.' In the progress maps developed for the national curriculum, up to ten levels of attainment are defined

and used as a frame of reference for reporting students' achievements over the age range 7 to 16.

Level descriptions define the type and range of performance which pupils working at a particular level should characteristically demonstrate. Teachers will determine which level description best fits a pupil's performance. In reaching a judgement they will use their knowledge of a pupil's work over time and across a range of contexts to balance different aspects of a pupil's performance.¹³

The progress map on page 19 shows five levels on a progression of developing writing competence constructed for the national curriculum assessment. Progress through the levels reflects increasing:

- control of specific features of the writing system;
- control of different forms of written texts; and
- adaptation for meaning and effect.¹⁴

'The ways in which criteria and scales are set up and used should relate to expected routes of educational development, giving some continuity to a pupil's assessment at different ages. The assessments should relate to progression.'

It is not necessary to presume that the progression defined indicates some inescapable order in the way children learn.¹⁰

The level descriptions are, of necessity, generalised descriptions that require interpretation in relation to concrete examples.¹¹

Mary James



Developing competence in writing

- 5 Pupils' writing is varied and interesting, conveying meaning clearly in a range of forms for different readers, using a more formal style where appropriate. Vocabulary choices are imaginative and words are used precisely. Simple and complex sentences are organised into paragraphs. Words with complex regular patterns are usually spelt correctly. A range of punctuation, including commas, apostrophes and inverted commas, is usually used accurately. Handwriting is joined, clear and fluent and, where appropriate, is adapted to a range of tasks.
- 4 Pupils' writing in a range of forms is lively and thoughtful. Ideas are often sustained and developed in interesting ways and organised appropriately for the purpose and the reader. Vocabulary choices are often adventurous and words are used for effect. Pupils are beginning to use grammatically complex sentences, extending meaning. Spelling, including that of polysyllabic words that conform to regular patterns, is generally accurate. Full stops, capital letters and question marks are used correctly, and pupils are beginning to use punctuation within the sentence. Handwriting style is fluent, joined and legible.
- 3 Pupils' writing is often organised, imaginative and clear. The main features of different forms of writing are used appropriately, beginning to be adapted to different readers. Sequences of sentences extend ideas logically and words are chosen for variety and interest. The basic grammatical structure of sentences is usually correct. Spelling is usually accurate, including that of common, polysyllabic words. Punctuation to mark sentences—full stops, capital letters and question marks—is used accurately. Handwriting is joined and legible.
- 2 Pupils' writing communicates meaning in both narrative and non-narrative forms using appropriate and interesting vocabulary, and showing some awareness of the reader. Ideas are developed in a sequence of sentences, sometimes demarcated by capital letters and full stops. Simple, monosyllabic words are usually spelt correctly, and where there are inaccuracies the alternative is phonetically plausible. In handwriting, letters are accurately formed and consistent in size.
- 1 Pupils' writing communicates meaning through simple words and phrases. In their writing, pupils begin to show awareness of how full stops are used. Letters are usually clearly shaped and correctly orientated.

The National Curriculum Assessment in England and Wales includes a progress map for assessing and monitoring achievement in writing.

British Columbia Communication Skills Assessment

The British
Columbia
Provincial
Learning

Assessment Program involves the systematic collection and interpretation of comprehensive, province-wide information about student learning. The communication skills assessment is designed to provide information about the development of communication skills across twelve grade levels.

The reading and writing achievements of students are assessed and reported against progress maps (referred to as reading and writing 'reference sets') developed by the Ministry of Education.

The progress map on page 21 shows six levels of the reading comprehension scale (reference set) used in the communication skills assessment. The levels are labelled Emerging to Interpretive. The descriptions of each level outline the kinds of literal and inferential reading skills characteristic of students achieving at that level.

The intent of the reference sets is to provide a common language for teachers to use to describe student progress; to help teachers see phases of growth in the development of basic skills; and to help teachers set performance standards for individual students in basic skill areas and identify goals for future learning.¹⁵

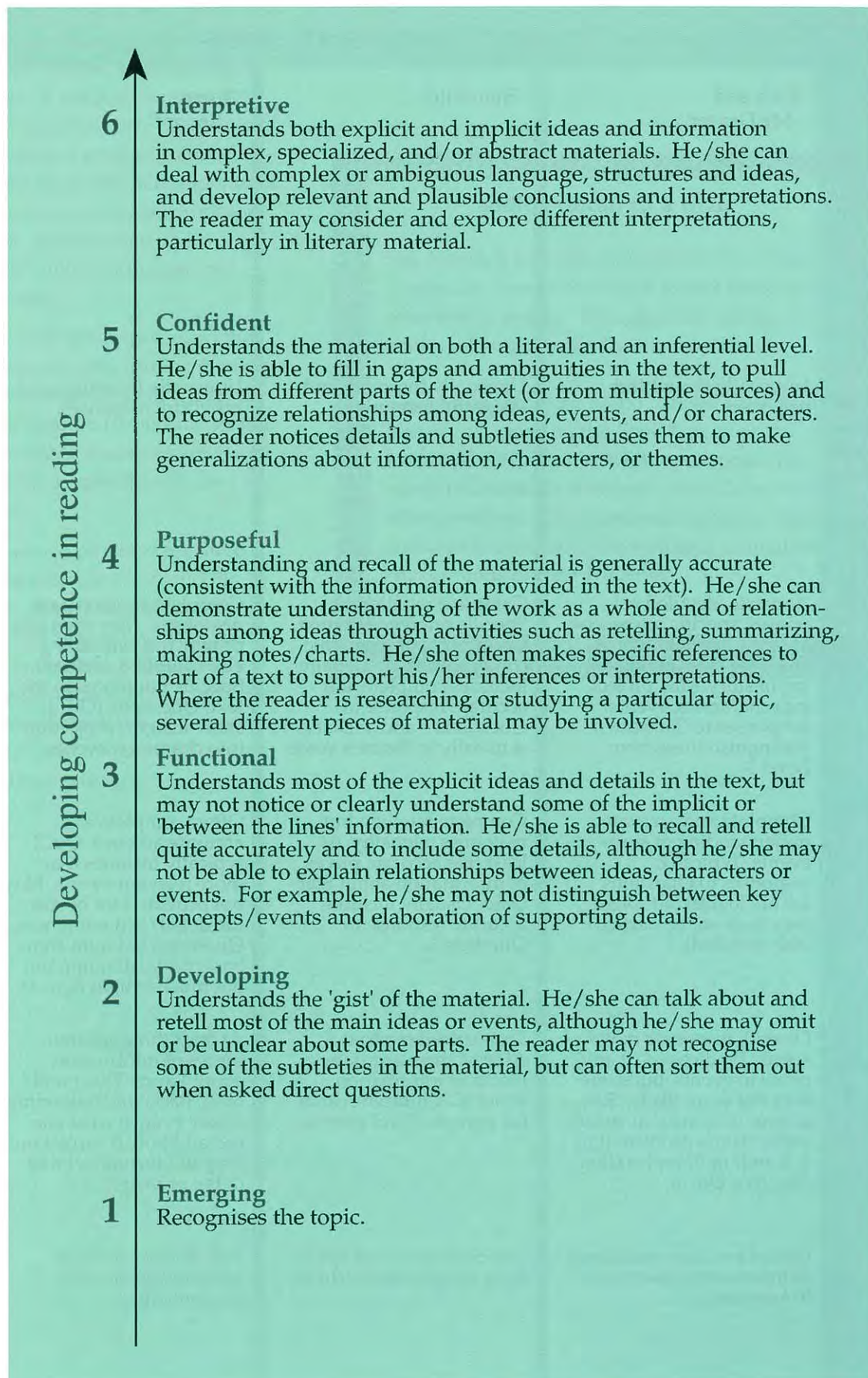
Progress maps provide a common language for teachers to use to describe student progress.

Assessors use a student's responses to questions about a passage to make an on-balance judgement of the student's level of comprehension.

Instructions to Assessors

We will be assessing each reading example holistically using the comprehension scales from the Reading Reference Set. In holistic assessment, the coder makes a decision about the overall quality of a piece of work in terms of the rating scale descriptions. In reading, you will be considering all of a student's work for a passage, then making a decision about the overall level of comprehension . . . You will be using the same scale for all passages.¹⁶

British Columbia communication skills assessment



The British Columbia communication skills assessment includes a progress map for assessing and reporting levels of reading comprehension.

Reading Assessment Tasks

6	Interpretive	'Josh and Mr Dexter'	'Starchild'	'Laura Secord'
5	Confident	Unusually thoughtful responses.	Unusually thorough and insightful responses.	Unusually thorough and insightful responses.
4	Purposeful	Accurate, detailed responses, specific references to story. Predictions are based on clear understanding of story. May project into characters, events. Responses to Qu.6 often distinguish these from Level 3.	Complete retelling. Specific references to text. Description of telepathic communication. Usually includes complete and accurate response to Questions 3 and 4. Diary is usually in Elaine's voice.	Complete and accurate responses. May miss one or two, but everything else complete, accurate. Specific references to the text. Questions (Qu. 4) show insight/projection into character/events.
3	Functional	Complete and accurate understanding of story events. Typically, responses to Questions 2-5 are logical (although they may not be particularly detailed).	Complete retelling but may miss telepathy. At least five accurate pieces of information about Starchild. Usually includes accurate response to Question 3.	Offers complete and accurate account. Qu. 2 typically includes 6 or more relevant events. May not provide a lot of specific detail/text references. Questions to Laura show basic understanding but not much insight (Qu. 4).
2	Developing	Overall, responses make sense. Predictions (if any) relate to events, but some may not seem likely. Responses indicate that student understands problem (Qu. 1, 2 and/or 3) and ending (Qu. 5 or Qu. 6).	Lost extra-terrestrial. At least three accurate pieces of information about it. Children search for parents. Find parents.	At least three accurate pieces of information about Laura (Qu. 1 and/or 3). Basic understanding of key events: what she did and how it turned out. May not include a lot of detail or insight.
1	Emerging	One or two accurate pieces of information (boy wants to keep cat...).	Lost Starchild from space (may simply be sketched).	One or two pieces of accurate information somewhere.

Assessors are given assistance in interpreting the levels of the reading comprehension scale for particular passages.

In the Reading section of the British Columbia communication skills assessment, students read a number of passages and answer questions about each. The Ministry develops and reviews comprehension questions for their importance and purpose, ethics and appropriateness, accuracy and ability to provide valid information, and practicality.

Each student's responses to the questions about a reading passage are then used to assign a level of comprehension (from Emerging to Interpretive). Assessors are given advice on assigning levels for each passage.

The advice provided for three reading passages ('Josh and Mr Dexter', 'Starchild', and 'Laura Secord') is shown opposite. Each level on the British Columbia comprehension scale is interpreted in terms of the kinds of responses students give to questions about these three passages.

adding detail to a map

Lisa Norwich in Seattle noticed that the Writing continuum being used in her school made little reference to poetry. She suggested adding outcomes relating to poetry to the continuum.

Teachers on Bathurst Island realised that examples of outcomes on the English as a Second Language (ESL) profile, while appropriate for many ESL students, were not particularly useful when working with Aboriginal students. They added examples more relevant to the language backgrounds of their students.¹⁷



Hong Kong Target Oriented Curriculum

The Target Oriented Curriculum initiative of the Hong Kong Department of Education is an attempt to provide clearer direction to teaching, learning and assessment by setting common learning targets for students. As part of this initiative, the Department has constructed progress maps, initially in the learning areas of Chinese, English and mathematics, divided into eight bands of performance.

Each band of performance sets out broad target-oriented attainments: descriptions of what students do at that level of attainment, and how well they do it. Teachers use the descriptions to indicate which band best represents an individual's performance.¹⁹

The progress map on page 25 shows the lower five bands of the

Hong Kong progress map for English speaking. The descriptions shown here are for the 'knowledge' dimension. Other descriptions are provided for the 'interpersonal' and 'experience' dimensions. Progress maps also have been constructed for writing, listening, and reading.²²

Criterion-referenced assessment is more consistent with the nature of progression in learning, since it makes explicit the progressive criteria which capture typical student progress in learning.¹⁸

Education Department,
Hong Kong

In order to capture what typical progress in performance looks like, eight progressive bands of performance are being developed to describe progress in performance from Primary 1 to Secondary 5. The eight bands of performance will constitute an explicit map of progression to assist teachers to record student performance.²³

Education Department,
Hong Kong

Target oriented assessment values the judgements which teachers make of student performance on tasks. Teachers therefore have a very important role to play in assessment. In the Target Oriented Curriculum system the common learning targets, the descriptions of bands of performance, and the teacher's professional judgement provide a basis for common understanding among teachers and students of what progress has been achieved. With appropriate in-service teacher education support, they also provide a means for achieving consistency across schools in judgements of student progress.²⁰

Education Department, Hong Kong

The assessment system needs to allow for continuity in student assessment so that progress in learning can be monitored over time. It is not sufficient for teachers or educational administrators to assume that students are making progress in the longer term. Both short-term and long-term progress need to be supported, monitored and described explicitly.²¹

Education Department, Hong Kong

Band 5

Finds out, organizes, interprets and presents information on a range of topics; identifies ideas and expresses opinions; begins to differentiate degrees of formality in language use and to use some simple strategies with support to clarify meaning.

- participates in structured discussions meaningfully, seeking clarification of what has not been understood;
- reports on simple events, familiar topics and solutions to problems;
- expresses ideas, information and opinions on straightforward issues;
- demonstrates some awareness of how to vary the formality of speech according to situation.

Band 4

Finds out, organizes, and presents given information on both familiar and less familiar topics; interprets and uses information and ideas; expresses opinions, and solves problems and describes the solution.

- participates in a short discussion meaningfully;
- makes a short report verbally on an event or topic;
- rephrases or corrects what they have just said if it has not been understood;
- expresses ideas and information in a logical and clear manner.

Band 3

Finds out, organizes and presents given information on familiar topics; interprets and uses given information and ideas; expresses opinions based on these; and solves straightforward problems and describes the solutions.

- expresses ideas and opinions on a given topic;
- participates in exchanges of personal information with others;
- gives a simple but clear sequence of instructions or directions;
- requests clarification of something that has not been understood.

Band 2

Provides and uses simple information and states opinions based on information and ideas provided in simple spoken texts on less immediate but still familiar topics; and recognizes and solves simple problems.

- produces simple utterances to convey information on familiar topics;
- asks and answers questions on topics that are familiar or immediate;
- speaks in planned situations such as giving a short report on a familiar or chosen topic;
- communicates effectively even when not all needed vocabulary items are known.

Band 1

Provides and uses simple information in short spoken texts supported by visual means and based on immediate and familiar experiences.

- uses some commonly occurring expressions appropriately;
- produces with the correct pronunciation individual words in appropriate contexts;
- uses one-word or short-phrase answers to simple questions about familiar experiences.

The Hong Kong Target Oriented Curriculum includes a progress map for assessing competence in speaking English.

All students pass through the same stages in developing their language skills, but may differ in their pace and ways of learning.

Ontario Ministry

Ontario Provincial Standards

The Ontario Ministry of Education and Training has developed provincial standards in language and mathematics as a 'consistent way of assessing student performance on a province-wide basis'.²⁴ The language and mathematics standards take the form of progress maps which describe six levels of increasing achievement in various strands of language and mathematics learning.

An example of one of the Ontario progress maps is shown on page 27. This map describes developing competence in Extended French listening. Levels 3, 4 and 5 on this map are levels of achievement expected of all ninth grade students by the end of the school year. Levels 1 and 2 are stages through which students may progress, but are levels of performance below the standard expected of ninth grade students. Level 6 is beyond the standard expected of all students.

Language progress maps have been developed for four language strands in English and French:

- Listening and Speaking
 - Reading
 - Writing
 - Viewing and Representing
- and six strands of mathematics:
- Problem Solving and Inquiry
 - Number Sense and Numeration
 - Geometry and Spatial Sense
 - Measurement
 - Patterning and Algebra
 - Data Management and Probability.

The maps of the Ontario provincial standards are intended primarily for teachers to use when assessing student performance and communicating with parents about students' levels of achievement. Their primary purpose is to make a clear statement to teachers, parents, and students about expected results.

The standards make it possible to assess students' progress in specific areas of learning with greater precision. They will also help teachers report to parents in greater detail and in more concrete terms. In addition, they will be used to conduct province-wide reviews and may be used locally to assess specific programs.²⁵

Ontario Ministry

The standards are based on the understanding that all students can be successful in more areas if the criteria for success are clearly defined for them. The organization of the standards reflects the complex process of learning and should assist teachers, parents or guardians, and administrators in observing and recognizing the developmental nature of this process.²⁶

Ontario Ministry

Level 6 *Listens critically in a variety of situations and understands oral texts from a variety of sources.*

- consistently demonstrates understanding of spoken language on a variety of topics, and uses listening skills to provide leadership;
- listens critically in order to respond in a variety of ways and to acquire new language related to a variety of topics;
- distinguishes most differences in vocabulary and idiomatic expressions in French spoken in Canada and in some other regions.

Level 5 *Listens attentively in familiar situations and understands oral texts from a variety of sources.*

- demonstrates understanding of key ideas and supporting details in a variety of oral texts, sometimes providing leadership in classroom activities;
- listens critically in order to respond in a variety of forms and to acquire new language related to familiar topics;
- distinguishes major differences in vocabulary and idiomatic expressions in French spoken in Canada and in some other regions of the world.

Level 4 *Listens attentively in familiar situations and understands key information and supporting details.*

- demonstrates understanding of key ideas and supporting details in oral texts by asking and answering questions, sometimes interpreting for others;
- listens in order to respond as requested and to acquire new language related to familiar topics;
- distinguishes major differences in vocabulary and idiomatic expressions in French spoken in Canada and in some other regions of the world.

Level 3 *Listens attentively in familiar situations and understands key information and some supporting details, when given occasional support.*

- demonstrates understanding when key ideas and some supporting details in oral texts are repeated;
- listens to short oral texts and formulates short responses when given some support;
- distinguishes major differences in pronunciation and vocabulary in French spoken in Canada and in some other regions of the world.

Level 2 *Listens to and understands key information in familiar situations when given some support.*

- follows instructions for a variety of classroom activities, formulates brief answers to questions and occasionally asks questions;
- gives responses in simple language to oral texts when given some support;
- distinguishes sounds that convey meaning if spoken in a familiar accent or if spoken slowly and repeated.

Level 1 *Listens to and understands key information in familiar situations, when given extensive support.*

- follows instructions for familiar classroom activities and formulates brief answers to questions;
- gives brief responses in simple language to oral texts when given extensive support;
- distinguishes some sounds that convey meaning if spoken in a familiar accent or if spoken slowly and repeated.

The Ontario provincial standards include a progress map for assessing and monitoring extended French listening.

The Benchmarks are based on a *growth* model of learning. They provide a frame of reference for monitoring individual growth.

Toronto Benchmarks

The Toronto Board of Education has constructed progress maps in language and mathematics as part of its 'Benchmarks' program. Each of the Board's progress maps is divided into (usually five) described and illustrated levels of performance in an area of learning. The Benchmarks were developed in response to parents' requests for clearer information about their children's progress in school. Benchmarks are designed to provide system-wide reference points to assist teachers in student assessment.²⁷

The Toronto Benchmarks provide progress maps in a range of learning areas including reading, writing, viewing, listening, measuring, estimating, speaking, role playing, and problem solving. Teachers are provided with assessment tasks in these learning areas and videotapes of student performances to illustrate the levels on each progress map.

The Toronto maps were developed from a careful analysis of students' performances on assigned tasks. The levels were not specified ahead of time, but reflect what students in Grades 3, 6 and 8 do *in practice*. In this sense, they can be thought of as having been developed in a 'bottom-up' manner from students' responses to assigned tasks, rather than in a 'top-down' way based on teachers' and

curriculum specialists' professional opinions (see page 13).


The Toronto Benchmarks capture a range of students' performances on tasks suitable to each grade. It is not the intention that teachers will use only Benchmark tasks in their classes. In assessing and reporting progress, it is anticipated that teachers will use language and mathematics tasks similar to, but not necessarily the same as, the provided tasks.

The Benchmarks represent what students can do on activities that operationalize the Ministry curriculum objectives. This approach to defining standards of student achievement is subtly different from approaches that attempt to define what students should do or to state the critical learning outcomes that students are expected to demonstrate at a given point in time.²⁹

Benchmarks should be thought of as a collection of references for evaluating the growth of individual students. Benchmarks do not put a ceiling on that growth, limit the growth to a narrow band of intellectual activities, or suggest that performance at a lower level means failure. Benchmarks represent a growth model of learning.²⁸

Sylvia Larter

Developing competence in storytelling

- 
- 5 The student demonstrates a knowledge of the features of stories and is aware of the needs of an audience. There is a complete telling of a story with elaboration and imaginative details that extend the information provided by the pictures. The student attempts to incorporate feelings such as happiness, annoyance and frustration. The story is cohesive with an effective opening and conclusion. The student may attempt to use dialogue and/or interjections to highlight various parts of the story and to engage the reader's attention. The writing shows control over the conventions of written standard English.
- 4 The student demonstrates a sense of story-telling and some awareness of audience. There is a complete and adequate telling of the story but with simple, straightforward interpretations of the pictures. The story is fairly cohesive and has an opening and conclusion. There may be an attempt to use dialogue. The writing shows moderate control over the conventions of written standard English.
- 3 The student demonstrates some control of story form. There is an attempt to tell the story and follow the pictures. Important details of the story, however, may be omitted. Sentences may be joined by repeated use of "then" and there may be repeated use of certain phrases. The student may describe the pictures instead of creating a story. The writing shows some control of the conventions of written standard English.
- 2 The student demonstrates some control of story form. There is a short and simple telling of the story, sometimes with digressions. Some of the pictures may be skipped over. The story may have an appropriate beginning but the story-telling is not sustained. The student tends to use short, incomplete, repetitive sentence patterns. The writing shows some control of the conventions of written standard English.
- 1 No response or very limited response.

The Toronto Benchmarks include a progress map for assessing competence in storytelling.

US National Assessment of Educational Progress

The US National Assessment of Educational Progress (NAEP) uses proficiency scales with described 'proficiency levels' to report the achievements of national samples of American students in a range of curriculum areas. NAEP has monitored the achievements of fourth, eighth, and twelfth grade students over a quarter of a century.

The progress maps of the US national assessment are constructed from a statistical analysis of students' performances on assigned tasks. In this sense, the construction of NAEP proficiency scales is another example of a 'bottom-up' approach to the construction of progress maps (see page 13). The described proficiency levels identify the kinds of tasks that students at each level are typically able to perform.

In the Civics learning area, assessment tasks are designed to assess students' knowledge and understanding of the United States government and politics. These tasks cover a variety of topics, including the structures and functions of particular institutions, the responsibilities of different levels of government, and the rights and responsibilities of citizens.

Students' levels of attainment in Civics are reported on a continuum marked out with numbers from 0 to 500. Along this continuum, four levels of proficiency are identified, corresponding to positions of about 200, 250, 300, and 350. These described levels are shown on page 31.

The descriptions of NAEP proficiency levels are developed by asking subject area specialists to review the results of statistical analyses and to describe the knowledge, skills and understandings typical of students at each level of performance on the scale.

As well as the summary descriptions shown on page 31, NAEP reports provide a comprehensive explanation of each proficiency level and examples of assessment tasks which illustrate each of the described levels.

The main purpose of the (statistical) analysis is to provide a common scale on which performance can be compared across groups (for example, ages or grades) and subgroups (for example, those identified by gender or race/ethnicity) whether assessed at the same time or a number of years apart.³¹

The Civics Report Card

The four sets of questions—corresponding to the four proficiency levels on the NAEP Civics scale—were studied by a panel of distinguished civics educators, who carefully articulated the types of knowledge, skills, and reasoning abilities demonstrated by correct responses to the questions in each set . . . As a result of this process, each performance level was described in a manner that portrayed students' knowledge and understanding of civic content and their ability to apply these in a variety of contexts.³⁰

The Civics Report Card





Level 350

Understands a variety of political institutions and processes

Students at this level are distinguished by their broader and more detailed knowledge of the various institutions of government. For example, they can describe the responsibilities of the president, the Congressional power to override presidential vetoes and levy taxes, and the practice of judicial review. These students have a more elaborated understanding of a range of political processes—for example, presidential campaigns, primary elections, and public opinion polls. Their expanding political vocabulary includes such specialized terms as closed primary, impeachment, referendum, and recall election.

Level 300

Understands specific government structures and functions

At this level, students have a more differentiated understanding of the structures, functions, and powers of American government as prescribed in the Constitution. For example, they have an increased understanding of federalism, are aware of the separation and allocation of powers, and grasp the concept of judicial review. These students are also familiar with certain historical events and legal precedents that have helped to shape our democratic heritage. They can apply their knowledge of individual rights to particular situations, and their conception of citizen action now includes cooperative political activity, such as boycotts and lobbying. These students are familiar with such terms as chief executive, constitutional rights, veto, and lobbyist, indicating an increasing understanding of the language of American politics. They can apply their civic knowledge to a larger number and variety of complex situations.

Level 250

Understands the nature of political institutions and the relationship between citizen and government

Students at this level are developing a knowledge of the nature of democratic institutions and processes. For example, they recognize the value of having more than one candidate in an election and the importance of the secret ballot. They are aware of the functions of a variety of government institutions and display a beginning understanding of federalism, as indicated by their ability to recognize the responsibilities of different levels of government. These students are developing an understanding of the reciprocal relationship between citizen and government. In addition to perceiving the purpose of individual rights in a democratic society and being able to identify some of these rights, such as the right to vote, they know of alternative ways to influence government—for example, making public speeches or writing letters to public officials. These students are developing a broader and more diverse political vocabulary.

Level 200

Recognizes the existence of civic life

Students at this level have a rudimentary knowledge of civics. They possess a beginning political awareness of the distinctions between the public and private domains and are familiar with some of the functions of government that pervade their immediate experience. They have some knowledge about elections and are developing an awareness of democratic principles such as the rule of law, as evidenced by their understanding that laws apply to government officials. These students also recognize that individuals—specifically the accused—have rights. Their elementary political vocabulary includes such terms as candidate, ballot, vice-president, judge, juror, and citizen.

The US National Assessment of Educational Progress includes a progress map for assessing and reporting levels of civics proficiency.

- 1 Boomer, G. (1991) The advent of standards in Australian education: Discussion paper on subject profiles/attainment levels in Australian schools, Adelaide: Department of Education, p. 7.
- 2 Curriculum Corporation (1994) *Mathematics – A Curriculum Profile for Australian Schools*, Carlton: Curriculum Corporation.
- 3 Curriculum Corporation (1994).
- 4 Curriculum Corporation (1994) *Arts – A Curriculum Profile for Australian Schools*, Carlton: Curriculum Corporation, p. 5.
- 5 Campbell Hill, B. & Ruptic, C. (1994) *Practical Aspects of Authentic Assessment: Putting the Pieces Together*, Norwood, MA: Christopher-Gordon PublishersInc., p. 235.
- 6 Campbell Hill & Ruptic, p. 242.
- 7 Campbell Hill & Ruptic, p. 236.
- 8 Campbell Hill & Ruptic, p. 236.
- 9 Campbell Hill & Ruptic, p. 236.
- 10 Black, P. (1987) *Report of Task Group on Assessment and Testing* London: Department of Education and Science.
- 11 James, M. (1994) Trying to be level-headed about level descriptions. University of Cambridge Institute of Education.
- 12 Black, P.
- 13 School Curriculum and Assessment Authority (1995) *Consistency in Teacher Assessment: Advice to Schools*, London: SCAA, p. 1.
- 14 School Curriculum and Assessment Authority (1995) *Exemplification of Standards: English: Key Stages 1-2*, London: SCAA.
- 15 Ministry of Education, British Columbia (1995) *The 1993 British Columbia Communication Skills Assessment: Technical Report. No. 1*, p. E-2. (For descriptions of the reading levels see also Ministry of Education, British Columbia Spring 1994 *Evaluating Reading Across the Curriculum: Using the Reading Reference Set to Support Learning and Enhance Communication*.)
- 16 Ministry of Education, British Columbia.
- 17 Conversations with Lisa Norwich in Seattle and teachers at Xavier Community College, Bathurst Island, Australia.
- 18 Education Department of Hong Kong (1994) *General Introduction to Target Oriented Curriculum*, Hong Kong: Education Department, p. 27.
- 19 Education Department of Hong Kong (1995) *Target Oriented Curriculum: Assessment Guidelines: Key Stage 1*, Hong Kong: Department of Education.
- 20 Education Department of Hong Kong *Assessment Guidelines: Key Stage 1*, p. 4.
- 21 Education Department of Hong Kong *General Introduction*, p. 27.
- 22 Education Department of Hong Kong (1995) *Target Oriented Curriculum: Programme of Study for English Language: Key Stage 1*, Hong Kong: Department of Education, pp. 87-89.
- 23 Education Department of Hong Kong *General Introduction*, p. 30.
- 24 Ontario Ministry of Education and Training (1995) *The Common Curriculum: Provincial Standards: Language, Grades 1-9*, p. 4.
- 25 Ontario Ministry of Education and Training (1995) *The Common Curriculum: Policies and Outcomes. Grades 1-9*, p. 11.
- 26 Ontario Ministry of Education and Training *Provincial Standards: Language. 1-9*, pp. 8-9.
- 27 Using the Benchmarks: A Handbook for School Staffs. Toronto Board of Education, 1991.
- 28 Larter, S. (1991) 'Benchmarks: Toronto's response to the testing problem'. *Federation of Women Teachers' Associations of Ontario Newsletter*, Vol 10, No. 1, p. 5.
- 29 Larter, S.
- 30 Educational Testing Service (1990) *The Civics Report Card*, Princeton, NJ: ETS, p. 29.
- 31 Educational Testing Service p. 95.

revising a progress map

Once a progress map has been drafted by a group of teachers and/or subject matter specialists, the resulting draft must be checked against some actual student performances. This checking process may lead to revisions of a map to make it a more accurate and useful description of typical student progress through an area of learning.

A first question to be asked of a draft map is whether the described learning outcomes work together in practice to define a single learning domain. Do the proposed outcomes work together to support the concept of a 'progression of learning' along which students' levels of attainment can be estimated?

Pages 34-36 provide an example of this checking process. In this example, different kinds of student writing (e.g. letters, narratives, arguments) are analysed to see whether they work together to define a general 'writing' progression. The analyses show that the preparation of text for *posters* appears to be a different kind of ability from writing arguments, letters, and stories, suggesting that outcomes which refer to the making of posters probably should not be included in a progress map for 'writing'.

A second question to be asked of a progress map is whether the *sequence* of outcomes along the map is supported by observations of student performance. Many progress maps drafted from expert knowledge and opinion (a process

referred to on page 13 as a 'top-down' approach to the construction of a progress map) also incorporate findings from relevant research into student learning. But there is always a question about how well a draft map describes typical student development: Is the draft continuum an adequate description of progress as observed by teachers?

If a draft map does not reflect the progression of learning typically observed in classrooms, then it will be difficult for teachers to use that map to make decisions about students' levels of attainment and progress. In the case of a very poor match (e.g. if students typically demonstrate the knowledge, skills and understandings described at Level 5 on a map before they demonstrate those appearing at Level 4), a draft map may be of little use as a frame of reference for monitoring student learning.

The process of checking (or verifying) a progress map involves the collection of information about actual student achievements. Do students usually demonstrate behaviours described at Level 1 before they demonstrate behaviours at Level 2? Do they usually demonstrate Level 2 behaviours before demonstrating Level 3? In other words, does the described sequence of outcomes on the achievement continuum match the sequence usually observed in classrooms?

The process of verifying a progress map is similar to taking a road map drawn from memory and checking its accuracy against the terrain it is intended to represent.



Pages 36-41 provide an example of the process of checking the sequence of outcomes on a draft progress map. The data analysed here are teachers' assessments of primary school students' spelling achievements based on the *First Steps* spelling continuum.

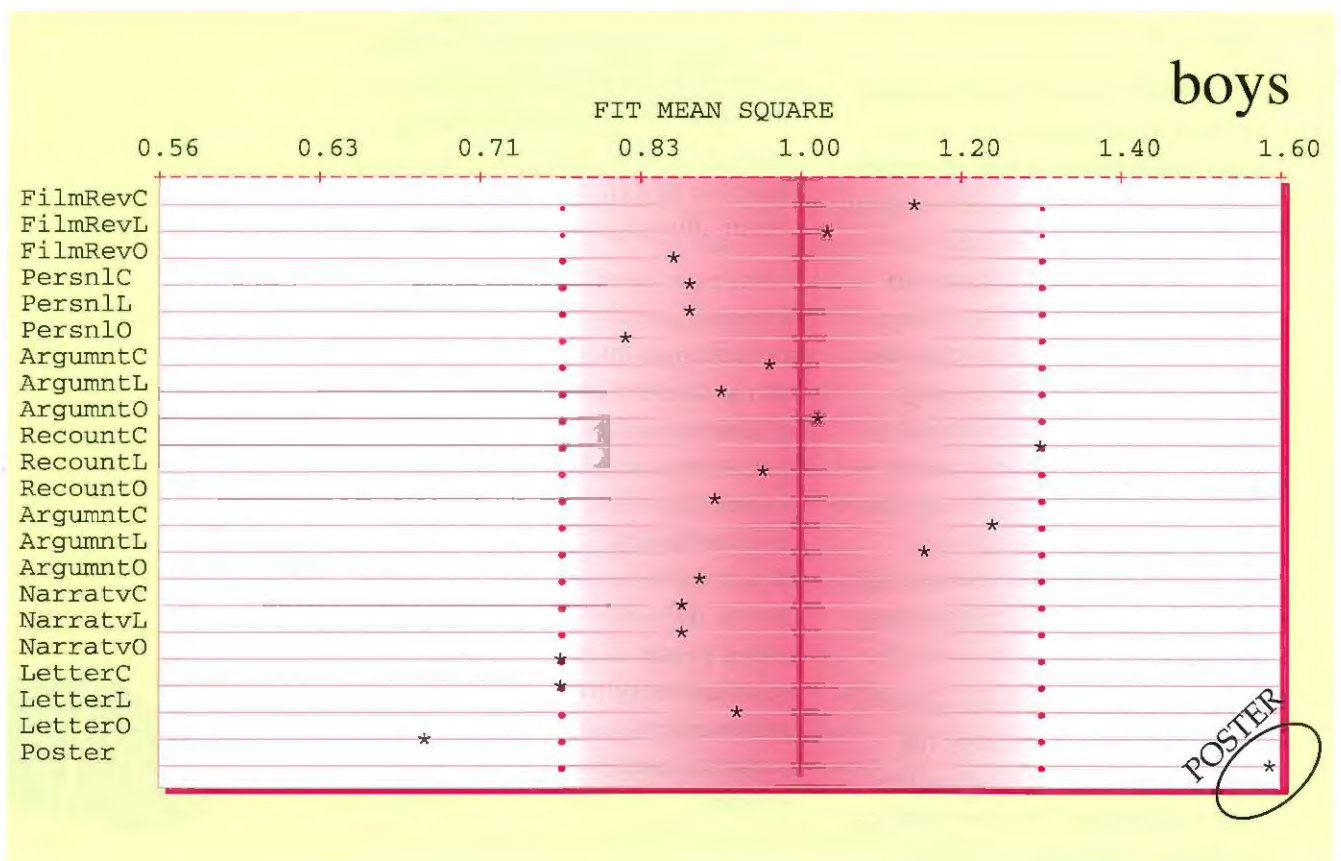
The analyses show that, even after revision, two levels on this draft spelling continuum are not well differentiated.

example 1 In the construction of assessment materials for upper primary *DART* English, a number of tasks requiring different types of writing were developed and trial tested.¹ These types of writing included a film review, personal/imaginative writing, an argument, a recount, a narrative, a letter, and a poster. It was

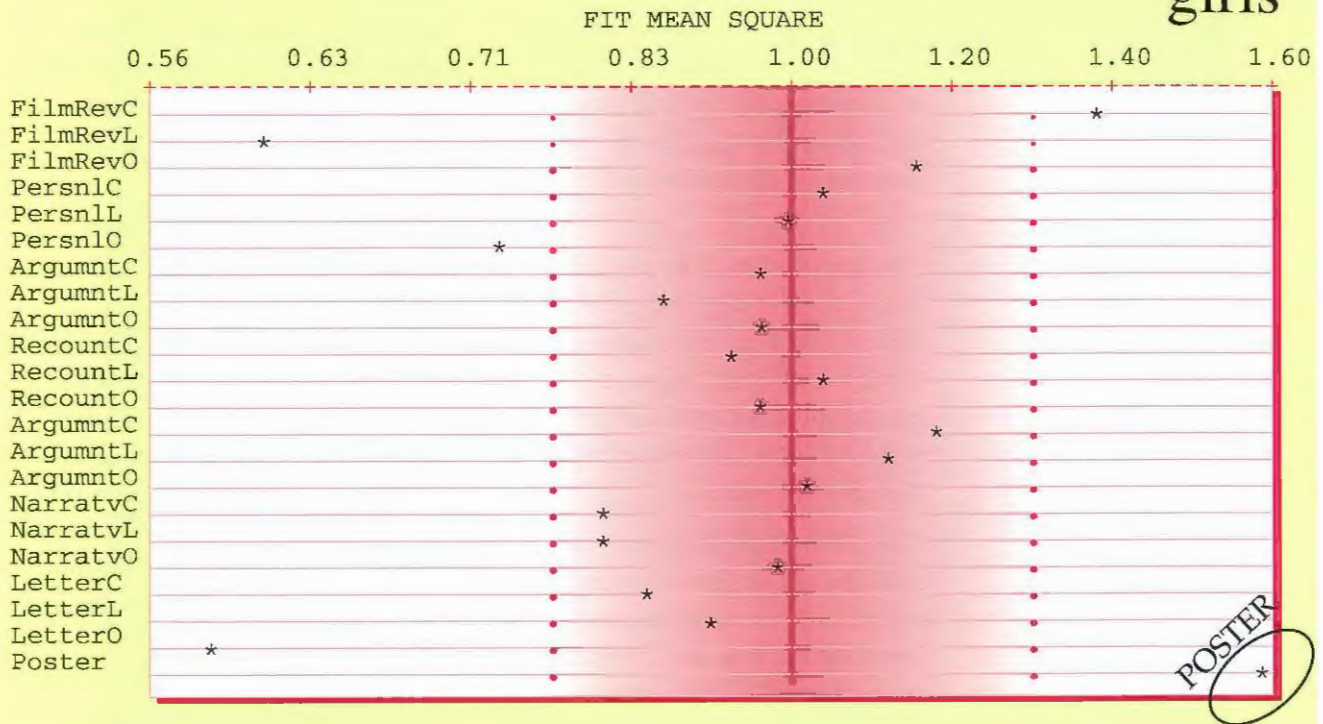
considered that valid measures of student writing would be based on several pieces and kinds of writing as described in the English profile for Australian schools.

Each piece of student writing was assessed for content/context (C), language features (L), and given an overall (O) rating. Students' responses to the poster task were given only an overall rating. All ratings were made against categories constructed to correspond to Levels 2, 3, 4 and 5 of the English profile for Australian schools.²

To investigate the extent to which the different writing tasks work together to define a single Writing strand, the ratings of student writing were analysed using an item response model for ratings.³ In these analyses, the content, language, and overall ratings of each



girls



piece of writing were treated as separate 'items', and the performances of girls and boys were analysed separately.

The displays on these two pages show output from a computer analysis of the ratings of student writing. The results of analysing the fit of each 'item' to the item response model are shown.⁴ When ratings conform to the model, 95 per cent of item fit values (marked *) are located in the shaded region between the parallel dotted lines. The values on the far right indicate items which have relatively low correlations with general writing ability; ratings on the left indicate items with unusually high correlations with general writing ability.

It can be seen from these two displays that ratings of students' posters are relatively poorly correlated with general writing ability. The poster task required students

to make a poster to advertise a pet show, conveying information about the show, including time and place. This task, perhaps because it involves limited rather than sustained text and includes an aesthetic/design element, does not 'fit' with the other writing tasks.

This observation resulted in a decision to not include the DART poster task in the evidence used to assess students' writing achievements. The poster was retained as a separate, optional task, with performances on the poster reported separately from students' writing assessments.

The results of these analyses also have implications for the construction of progress maps in writing. Indicators of writing achievement may be most likely to work together to define a meaningful achievement progression if they do not include references to the creation

of limited text of the kind typically found on posters.

example 2 The second example shows how a progress map in spelling was checked and revised using teachers' assessments of spelling achievement.⁵

The progress map in this example is one of several 'developmental continua' in Reading, Spelling, Writing, and Oral Language constructed by the *First Steps* program of the Education Department in Western Australia.⁶

The *First Steps* developmental continua are designed to assist teachers to assess and monitor individual progress in key areas of language learning. Teachers use the continua as frameworks for thinking about and monitoring students' language development. Each continuum can be used to estimate a student's current level of development and to identify the kinds of learning experiences likely to be helpful in promoting further language growth.

The *First Steps* Spelling continuum provides a sequence of statements called 'indicators' which describe spelling development. These indicators are clustered into five developmental 'phases' labelled 'preliminary', 'semi-phonetic', 'phonetic', 'transitional', and 'independent'. These five phases are summarised on page 37.

The 'preliminary' phase describes spelling behaviours which most children are assumed to exhibit as they first learn to spell. Most students are expected to demonstrate indicators from this phase before exhibiting behaviours from phases higher on the continuum. The

behaviours identified in the 'independent' spelling phase are intended to represent the highest levels of spelling attainment. Students displaying these behaviours should demonstrate most or all of the spelling behaviours from phases lower on the continuum.

The draft of the *First Steps* Spelling continuum drew on a considerable body of published research. There was thus good reason to believe that the indicators identified in the draft continuum were useful guides to spelling development. Less clear, however, was the validity of the sequence of indicators on the draft continuum. To what extent did this sequence match the order observed by teachers? To answer this question, the *First Steps* developers undertook a two-stage study in Western Australian schools.

an ideal?

Before considering the results of the *First Steps* study, it is useful to consider what an ideal structure for the *First Steps* Spelling continuum might be. This ideal is shown on the left of page 38.

In this ideal structure, the indicators from the five spelling phases are located in regions along the continuum. All indicators of the 'preliminary' phase are located at the bottom of the map; all indicators of the 'independent' phase are located at the top. A spread of indicators is assumed within each phase.

Ideally, there is no overlap of phases. The consequence of overlap would be that some indicators of an upper phase would be exhibited before some indicators of a lower phase, thereby confounding the intended order of phases and

To what extent does the order of *First Steps* spelling indicators match the order in which these behaviours typically develop in classrooms?



5 Independent Spelling

In this phase writers have become aware of the many patterns and rules that are characteristic of the English spelling system. When spelling a new word they use a multi-strategy approach. They have the ability to recognise when a word doesn't look right and to think of alternative spellings. Spellers in this phase will have accumulated a large bank of known words that they can automatically recall. Independent spellers continue to use personal constructions when spelling unfamiliar words in draft writing. Independent spellers realise the importance of proof reading.

4 Transitional Spelling

In this phase writers are moving away from a heavy reliance on the phonetic strategy towards the use of visual and meaning-based strategies. They may still have difficulty recognising if a word "looks right" but should be able to proof their known bank of words. Writing will show evidence of an increasing bank of words. This is a critical phase in the development of spelling. It often take writers a long time to move through it.

3 Phonetic Spelling

In this phase writers are able to provide an almost perfect match between letters and sounds. Letters are chosen on the basis of sound often without regard for conventional letter patterns. Spelling attempts are meaningful and becoming more like standard spelling. There is often evidence of self-constructed rules that may not conform to adult rules. Writers copy, recall and construct words according to their current understandings. They use rote recall for an increasing number of words.

2 Semi-Phonetic Spelling

In this phase children show developing understanding of sound-symbol relationships. Their spelling attempts show some evidence of sound-symbol correspondence. They may represent a whole word with one, two or three letters. In this, as in all phases of development, children will be copying, recalling and inventing words. Children at this phase are able to copy letter by letter.

1 Preliminary Spelling

In this phase children become aware that print carries a message. They experiment with writing-like symbols as they try to represent written language. Their writing is not readable by others as understandings of sound-symbol relationships have yet to develop. Children are fascinated by print and are constantly trying to explore the relationships between written and spoken words and between letters and sounds through emulating adults in role play of reading and writing.

The First Steps spelling continuum describes five phases of spelling development.

making it difficult to draw conclusions about students' locations on the developmental continuum.

Similarly, there are no gaps between phases. The consequence of gaps would be that some locations on the Spelling continuum would not correspond to any phase, again making it difficult to interpret the performances of some students in terms of the *First Steps* phases.

collecting evidence

The information used to check and revise the Spelling continuum was collected in a two-stage study in Western Australian schools. In the first stage, 39 teachers judged the achievements of up to ten students in their classes using indicators from the draft Spelling continuum. The findings of the first stage were then used to revise the draft continuum.

In the second stage, 88 teachers not involved in the first stage judged the achievements of students using the indicators of the revised Spelling continuum.

Teachers participating in the study were asked to make a judge-

ment about each student's achievement of each of a number of indicators. A student was judged to have achieved an indicator if they demonstrated that behaviour most or all of the time, or if they had moved beyond the indicator (e.g. if they had moved beyond 'Writes random strings of letters').

If a teacher was unable to say whether or not a student had achieved an indicator, either because they had not had an opportunity to observe the behaviour or because they did not understand the indicator, the teacher recorded 'Unable to judge' and gave the reason.

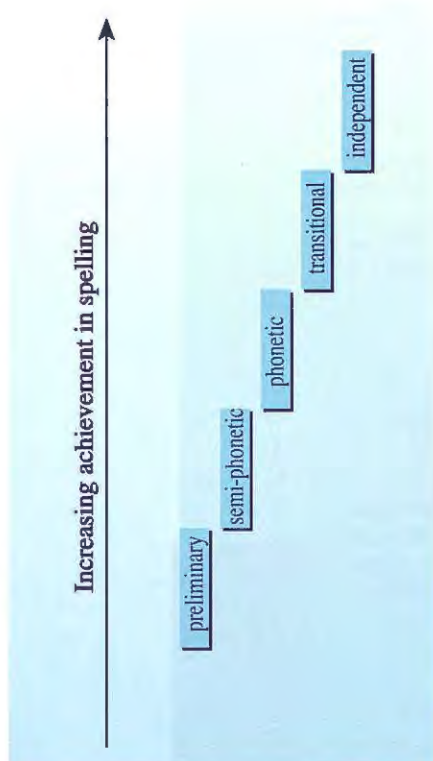
<i>Achieved</i>	B:	Beyond this indicator
	Y:	Yes / most of the time
<i>Not achieved</i>	N:	No / hardly ever
	U:	Unable to judge 1. no opportunity to observe 2. do not understand

All teachers recorded their judgments using provided computer software.

Teachers of Kindergarten and Year 1 students were assigned 68 indicators in random order from the lowest three Spelling phases.

	Kind.	Yr 1	Yr 3	Yr 5	Yr 7	Total
First Stage	—	90	74	106	83	353
Second Stage	136	197	191	174	145	843

The numbers of Kindergarten, Year 1, Year 3, Year 5, and Year 7 students involved in the two-stage study are shown in the above table.



Ideally, phases of spelling development might correspond to non-overlapping, equal width regions on the *First Steps* continuum.

	Num. of indicators	Kind.	Year 1	Year 3	Year 5	Year 7
Independent	20					✓
Transitional	20			✓	✓	✓
Phonetic	23	✓	✓	✓	✓	✓
Semi-phonetic	21	✓	✓			
Preliminary	24	✓	✓			

Each teacher was assigned indicators from several phases of the Spelling continuum.

Year 3 and Year 5 teachers were assigned indicators from the phonetic and transitional phases, and Year 7 teachers were assigned indicators from the three most advanced Spelling phases. Teachers were not told from which phases of the Spelling continuum indicators were drawn.

analysing the evidence

If the sequence of indicators along the draft Spelling continuum accurately depicts typical spelling development, then the indicators most often achieved by any group of students should be the indicators of the preliminary phase. The indicators least often achieved should be those assigned to the independent phase.

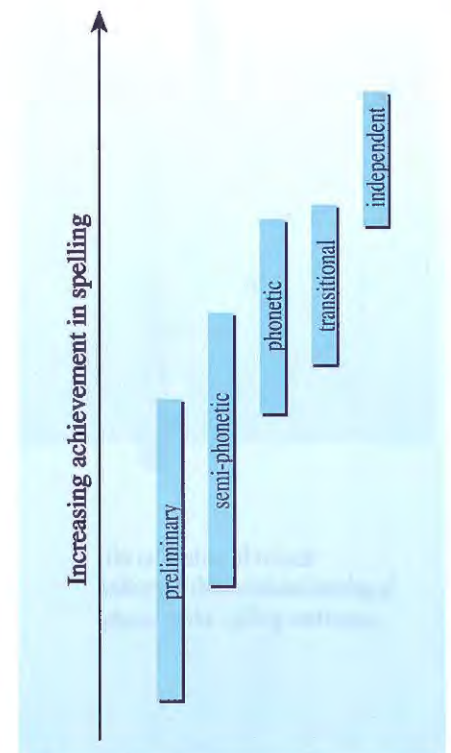
The judgements made by teachers were used to order the Spelling indicators according to their reported frequency of achievement. At one extreme in this order are the indicators most often judged to have been achieved by students in this study; at the other extreme are the indicators least often judged to have been achieved.

The picture on the right shows the results of the stage 1 analyses. In this picture, the spelling indicators have been 'calibrated' along the developmental continuum.

Each shaded box shows the spread of indicators within a phase based on teachers' judgements of how often those indicators were achieved. The spread of only the middle 75% of indicators in each phase is shown.

It can be seen from the picture on the right that there is considerable overlap of the draft phases. Some 'semi-phonetic' indicators are calibrated at lower levels on the continuum than some 'preliminary' indicators (reflecting the fact that teachers more often reported some semi-phonetic indicators to have been achieved than some preliminary indicators). The 'transitional' indicators appear to define much the same level of spelling attainment as the 'phonetic' indicators.

The structure of the draft Spelling continuum clearly does not approximate the ideal picture on the left of page 38.



The calibration of indicators in each phase shows considerable overlap of phases on the spelling continuum.

misplaced indicators

To investigate the reasons for overlap, the most extreme indicators in each phase were studied in some detail. The following indicator, for example, was assigned to the transitional phase:

The child has a bank of words that are used in writing.

Teachers judged this indicator to have been achieved more often than almost all indicators of the phonetic phase.

On reflection, it was recognised that the term 'bank of words' is ambiguous. Many students in lower spelling phases might be considered to have a 'bank' of words they can spell and use. To clarify the original intention of this indicator it was reworded and examples added:

The child is extending bank of known words that are used in writing, including some subject specific words, e.g. February, Christmas, restaurant, diameter, conservation, scientific.

In the second stage of the study, this reworded indicator was estimated to be in the same region of the Spelling continuum as most other transitional indicators.

Another misplaced indicator was:

The child writes one or two letters for sounds and then adds random letters to complete the word, e.g. crecuea (creature).

This indicator was assigned initially to the semi-phonetic phase, but teachers judged this indicator to have been achieved much less often than most other semi-phonetic indicators. On reflection it was realised that the example (crecuea) made this an indicator of the phonetic phase. It was

reworded:

The child writes one or two letters for sounds and then adds random letters to complete the word, e.g. greim (grass), rdms (radio).

A number of other 'misplaced' indicators of this kind were reworded to clarify their original intention. Two were deleted entirely.

unclear indicators

Teachers reported not understanding a few Spelling indicators. An indicator which was changed because it was not understood was:

The child is aware of social obligations as a speller.

This was changed to:

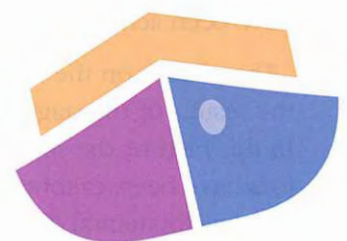
The child is aware of the importance of standard spelling for published work.

misfitting indicators

Other indicators were identified as 'misfitting' because they were not particularly helpful in estimating students' levels of attainment on the Spelling continuum. An example of a misfitting indicator was:

The child uses more letters for longer words.

There was a low relationship between reported achievement of this indicator and students' estimated levels on the Spelling continuum, perhaps because this statement is true at all levels of spelling development or because the mere use of 'more letters' is not indicative of greater spelling ability. This indicator was removed from the Spelling continuum.



the revised continuum

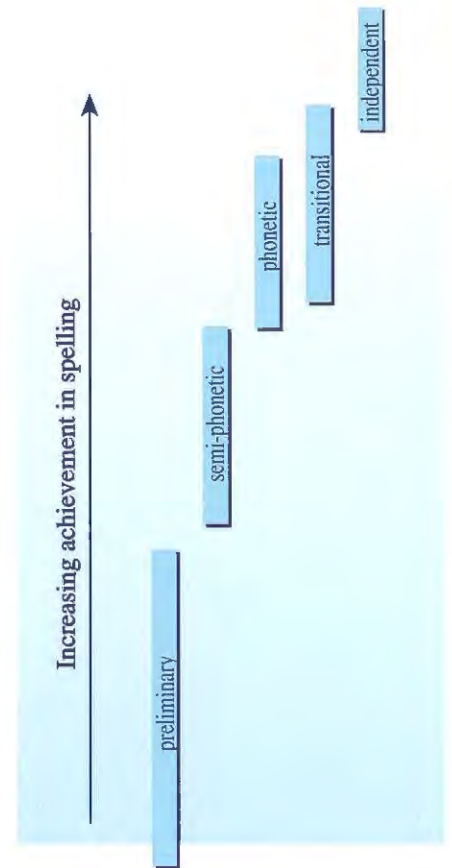
The rewording or deletion of misplaced, unclear, and misfitting indicators resulted in a revised and slightly smaller set of indicators for the Spelling continuum. This revised continuum was tested in the second stage of the Western Australian study. The method used in the second stage was identical to the method used in the first stage.

The analysis of teachers' judgements using the revised Spelling continuum is summarised in the picture on the right. Again, the calibrated locations of the middle 75% of indicators in each level are shown.

From this picture it can be seen that the revision of spelling indicators has resulted in less overlap of adjacent phases. The phases of the revised continuum more closely approximate the 'ideal' on page 38.

There remains, however, a problem with the transitional phase. This phase appears not to represent a higher level of spelling attainment than the phonetic phase. The problem with the transitional phase has been further investigated by the *First Steps* developers. One possibility is that there is a conceptual problem with this phase. While other spelling phases correspond to reasonably clearly defined stages of spelling development, it is less clear what it means to be 'in transition'.

These analyses have set in train thinking about what it is that characterises the transitional phase and so, at a more general level, how the Spelling continuum as a whole might be improved. The picture on the right suggests that it may be appropriate to combine the phonetic and transitional phase indicators to form a single phase between the semi-phonetic and independent phases.



The calibration of revised indicators shows reduced overlap of phases on the spelling continuum.

- 1 Forster, M., Mendelovits, J. & Masters, G.N. (1994) *Developmental Assessment Resource for Teachers: English*, Melbourne: Australian Council for Educational Research.
- 2 Curriculum Corporation (1994) *English – A Curriculum Profile for Australian Schools*, Carlton: Curriculum Corporation.
- 3 Andrich, D. (1978) 'A rating formulation for ordered response categories', *Psychometrika*, Vol. 43, 561-73.
- 4 The fit statistics used here are described by Wright, B.D. & Masters, G.N. (1982) *Rating Scale Analysis*, Chicago: MESA Press. The computer printout is from the interactive test analysis system, *QUEST*, developed by Ray Adams and Siek-Toon Khoo at the Australian Council for Educational Research.
- 5 This discussion is based on: Harvey-Beavis, A. (1994) 'Analysing teacher judgements with the Rasch model: Their contribution to the construction of continua to assess literacy development in the early years of school', presented at the annual meeting of the American Educational Research Association, New Orleans.
- 6 Western Australian Ministry of Education (1991) *First Steps Developmental Continua*, Perth, W.A.: Ministry of Education.

enriching a progress map

The article *drafting a progress map* (pages 13-32) describes the first step in constructing a map: proposing a domain of learning within which achievement is to be assessed and student progress monitored, and developing a draft of the sequence in which the knowledge, skills and understandings (i.e. 'outcomes') of the learning area typically develop. Two approaches to drafting a progress map are described: top-down approaches based on teachers' and curriculum specialists' knowledge and theories of student learning, and bottom-up approaches based on detailed analyses of students' responses to and performances on assigned assessment tasks.

The article *revising a progress map* (pages 33-42) describes and illustrates procedures for checking and revising draft maps against evidence of actual student achievements. These procedures are especially useful when progress maps are drafted in a top-down fashion without direct reference to student performances. The questions addressed are: To what extent do the identified learning outcomes work together to define a single domain of achievement, and does the sequencing of outcomes on the draft progress map reflect typical student progress as observed in classrooms?

The present article describes a further step in the construction of a progress map: the addition of detail to elaborate, clarify, and fill gaps in a progress map. Unlike the processes of drafting and revising, both of which are likely to be car-

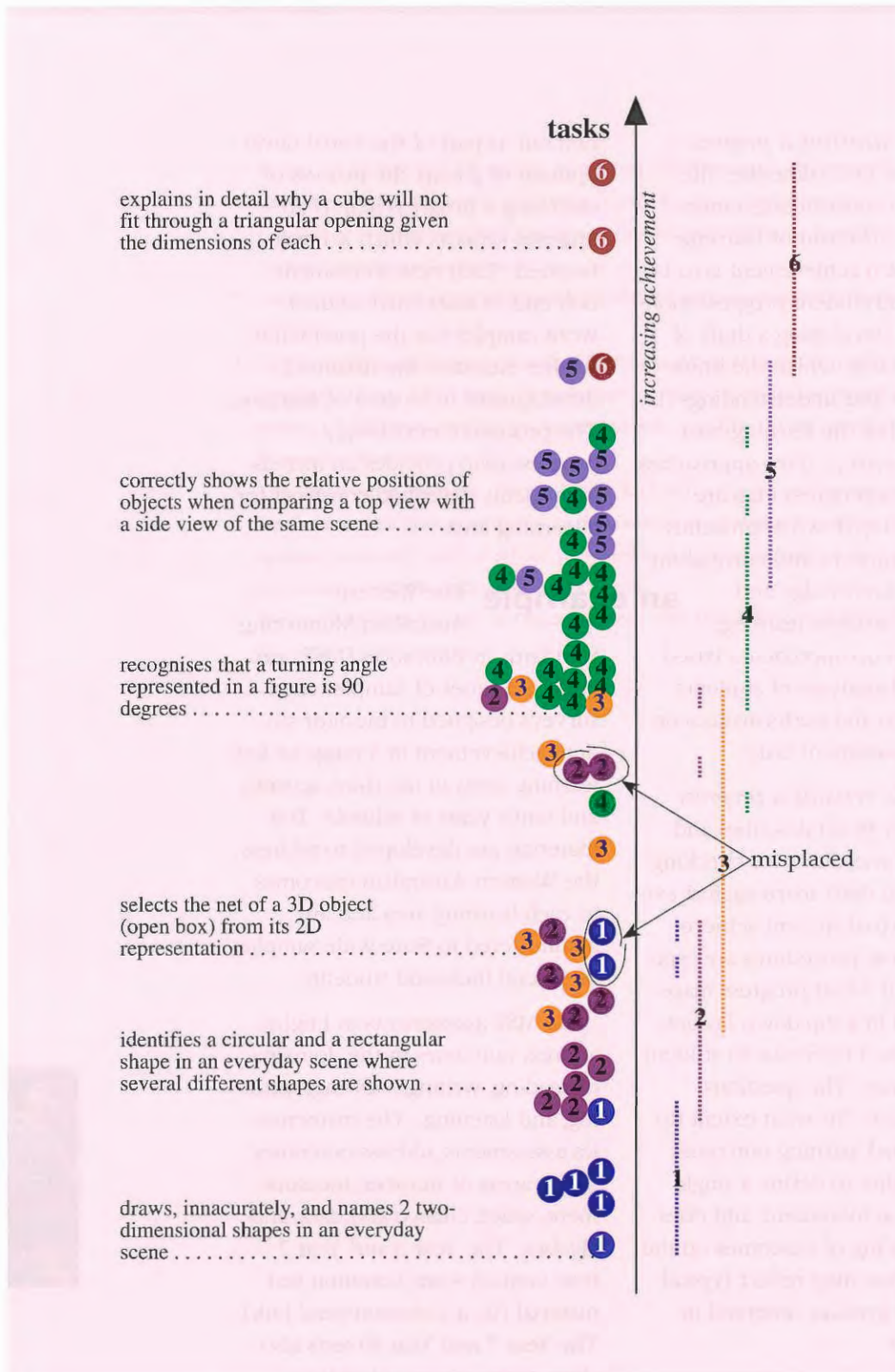
ried out as part of the initial development of a map, the process of enriching a progress map is an ongoing process which is never finished. Each new assessment task and its associated student work samples has the potential to further elucidate the nature of development in an area of learning. The process of enriching a progress map provides an increasingly richly-described construct for a learning area.

an example

The Western Australian Monitoring Standards in Education (MSE) program is a series of sample-based surveys designed to monitor student achievement in a range of key learning areas in the third, seventh and tenth years of school.¹ Test materials are developed to address the Western Australian outcomes in each learning area and are administered to State-wide samples of several thousand students.

The MSE assessments in English address outcomes in the domains of reading, writing, viewing, speaking, and listening. The mathematics assessments address outcomes in the areas of number, measurement, space, chance and data, and algebra. The Year 3 and Year 7 tests contain some common test material (i.e. a 'common-item' link). The Year 7 and Year 10 tests also share some common test items. The links across these three tests allow all items to be calibrated on a single achievement scale (progress map) within each domain of learning.





All MSE Space tasks were calibrated along a single progress map in Space.

The picture on page 44 shows MSE items calibrated along the Space strand of mathematics.² The calibrated position of each item (marked with a circle) reflects students' success rates on that item. The easiest items—from the Year 3 test—are at the bottom of the map; the hardest items—from the Year 10 test—are towards the top. Descriptions of some selected items are shown on the left.

The developers of the MSE test materials were asked to identify the outcome, and thus profile level, addressed by each item. The number inside each circle shows the profile level of the outcome addressed by that item.

It can be seen that the empirical difficulty order of the Space items is broadly consistent with the profile levels they were intended to address. The items developed to address Level 1 outcomes tend to cluster at the bottom of the map; items designed to address Level 2 outcomes cluster just above these; and so on to items designed to address Level 6 outcomes at the top of the map.

But there are some obvious inconsistencies. Two of the items identified as addressing Level 1 out-

comes (circled) are considerably more difficult in practice than other Level 1 items, and three items identified as addressing Level 2 outcomes (two circled) are as difficult as most Level 3 items.

'Misplaced' items of this kind are inconsistent with the intended order of the achievement levels on the Space continuum. There are two possible explanations for these inconsistencies: (i) the misplaced items do not adequately represent the outcome (and thus level) to which they have been tagged; and (ii) the outcome was not allocated to the appropriate achievement level in the first place.

A closer inspection of the circled items on page 44 shows that all four items come from the same Task 17 (below). In this task, students are asked to identify daisies which can be joined to make a rectangle 17(a) and a pentagon 17(b).

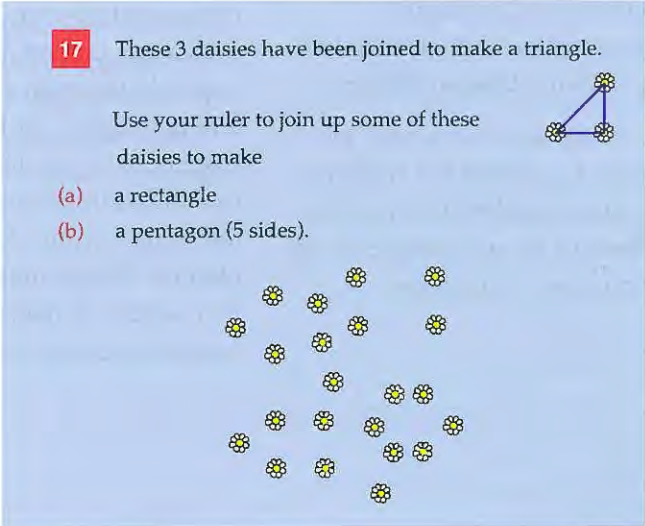
For each shape, students score 1 if they select appropriate daisies but do not join them accurately, and 2 if they select appropriate daisies and join them to form the required shape.

Misplaced items are inconsistent with the intended order of achievement levels.

17 These 3 daisies have been joined to make a triangle.

Use your ruler to join up some of these daisies to make

- (a) a rectangle
- (b) a pentagon (5 sides).



A large bank of calibrated assessment tasks provides a richly illustrated progress map.

The first step—selecting appropriate daisies—was considered by the test developers to be an example of the following Level 1 outcome:

Students pay attention to shape when they draw things which they remember, imagine, see or handle, eg

- attends to shapes when drawing things from memory (draws a seesaw with a long flat board balancing on a point roughly at the centre);
- draws things from an oral description which involves spatial language or implies shape ('draw a tall hat with a pointy top');
- conveys the essential spatial features of common mathematical figures in their drawings (draws a shape that resembles a triangle with three roughly straight sides which more or less join).

The examples provided as illustrations of this Level 1 outcome (drawing everyday objects and simple geometric shapes) describe a relatively low level of achievement. Students' performances on items 17(a) and 17(b) suggest that finding points in a pattern which can be joined to make shapes such as rectangles and pentagons requires a higher level of skill than simply drawing familiar shapes.

The second step—accurately joining daisies to provide the required shape—was considered by the test developers to be an example of the following Level 2 outcome:

Students pay attention to the shape and placement of component parts when they draw things, eg

- correctly draws figures showing the essential spatial features of named mathematical shapes (when asked to draw a pentagon, draws five straight sides that join end to end to form a closed curve);
- copies pictures composed of simple geometric figures so that the main components are recognisable in shape, position, and orientation.

Items 17(a) and 17(b) certainly require students to 'pay attention to the shape and placement of component parts', but the identification of points in a pattern which can be joined to make shapes such as rectangles and pentagons *and* the accurate completion of those shapes appears to be a higher level of skill than simply drawing pentagons on demand or copying pictures composed of simple figures.

These observations suggest ways of enriching the description of Levels 2 and 3 on the Space strand. At Level 2, students pay attention to the shape and placement of component parts when they draw things, and also are able to identify points in a pattern which, if joined, make shapes such as rectangles and pentagons. At Level 3, students interpret and produce drawings of real things by attending to what they can see, and also are able to identify and accurately join points in a pattern to make shapes such as rectangles and pentagons.

	Outcome	17(a)	17(b)
3	students interpret and produce drawings of real things by attending to what they can see	Step 2 select dots in a pattern and accurately join them to make a <i>rectangle</i>	Step 2 select dots in a pattern and accurately join them to make a <i>pentagon</i>
2	students pay attention to the shape and placement of component parts when they draw things	Step 1 select dots which could be joined to make a <i>rectangle</i>	Step 1 select dots which could be joined to make a <i>pentagon</i>
1	students pay attention to shape when they draw things which they remember, imagine, see or handle		

The descriptions of the two steps in Items 17(a) and 17(b) enrich the description of Levels 2 and 3 on the Space strand.

Each item developed for a domain of learning has the potential, when empirically calibrated, to enrich and clarify the description of typical student progress through that area of learning. A large bank of calibrated assessment tasks provides a basis for a richly illustrated progress map.



- 1 Ministry of Education Western Australia (1993) *Profiles of Student Achievement: Results of the 1992 Monitoring Standards in Education Program*, Perth, W.A.: Ministry of Education.
- 2 Discussion based on Masters, G.N. (1994) 'Setting and measuring performance standards for student achievement', Paper presented at the Conference on Public Investment in School Education: Costs and Outcomes, Canberra.



setting benchmarks

A progress map describes the path of typical student progress through an area of learning and so provides a framework for addressing such questions as:

- what is this student's current level of attainment?
- what kinds of skills and understandings are typically associated with that level?
- how much progress has the student made over time?
- have some students achieved higher levels than others?

But a progress map, by itself, does not answer questions about the adequacy of students' achievements:

- is this student's level of attainment good enough?
- what should students of this age be achieving?
- will this level provide an adequate foundation for the next stage of learning?

Questions of this second kind go beyond estimating students' levels of attainment to evaluating those achievements—in other words, making value judgements about their adequacy. In this process it is common to set benchmarks as points of reference.

Benchmarks can be either comparative or absolute.

Comparative benchmarks are set by reference to the achievements of others. An industry, for example, might use achievements in other, similar industries as bench-

marks for error rates, accident levels, or return on capital. Comparative benchmarking looks to practices elsewhere as a guide to what can be achieved.

In education, the performances of students on past occasions, in other schools, other States, or other countries are sometimes used as comparative points of reference. In making judgements about levels of student achievement, education systems may seek answers to such questions as:

- how do science achievements in this country compare with achievements in other countries?
- how do mathematics achievements in this State/Province compare with the mathematics achievements of students in other States/Provinces?
- how do students' literacy levels today compare with literacy levels ten years ago?

Absolute benchmarks, or 'standards', are set as desirable levels of performance for a particular purpose. For example, manufactured items usually must satisfy specified minimum standards in relation to properties such as flammability, durability, and strength.

In education, absolute 'standards' are set by considering what it is that students should know and be able to do. For example,

- what kinds of mathematics knowledge and skill should we set as goals for all students by the end of the sixth grade?

A benchmark is a point of reference for evaluating student achievements.



- what minimum levels of knowledge and skill should be required for certification to practise as a physiotherapist?

Although absolute benchmarks are expressed as desired levels of performance, they always take some account of current levels of student achievement.

This article illustrates several approaches to setting comparative (pages 50-52) and absolute (pages 52-57) benchmarks for student achievement.

comparative benchmarks ('norms') Comparative benchmarking uses achievements in other schools, education systems, States, or countries as points of reference for evaluating levels of achievement. The process of comparing the performances of a student or group of students with the performances of other students of the same age or grade is called 'norm referencing'. Usually, comparisons are made with the performances of nationally-representative samples of students.

national/international

Countries sometimes look to achievements in other, similar countries as a guide to evaluating student performances. France, for example, may be interested in knowing how the mathematics achievements of French students compare with performances in other Western European countries. New Zealand may be interested in knowing how the reading achievements of New Zealand students compare with performances in other English-speaking countries.

Achievement surveys conducted by the International Association for the Evaluation of Educational Achievement (IEA) and as part of

the International Assessment of Educational Progress (IAEP) can be used to establish comparative benchmarks for countries wishing to compare student achievements with performances in other parts of the world.

The picture on page 51 shows results from one international mathematics and science survey.¹ In this survey, representative samples of 13-year-olds were drawn from about 100 schools in each of five countries and four Canadian provinces. Each sampled student was assessed in both mathematics and science.

Page 51 shows average science results in each participating system. Results are reported against a progress map along which five levels of science achievement are described. The published report provides further details of these levels, including examples of student performance at each level.

Results are divided into three groups (in different colours). Differences between groups are statistically significant; differences within groups are not. The shaded band around each country's/province's average level of achievement indicates statistical uncertainty about the exact location of the average.

The inclusion of several Canadian provinces, and the decision to report results separately for English-speaking and French-speaking students in some provinces, allows Canadian provinces to compare their achievements with performances in other parts of Canada, as well as with performances in several other countries.

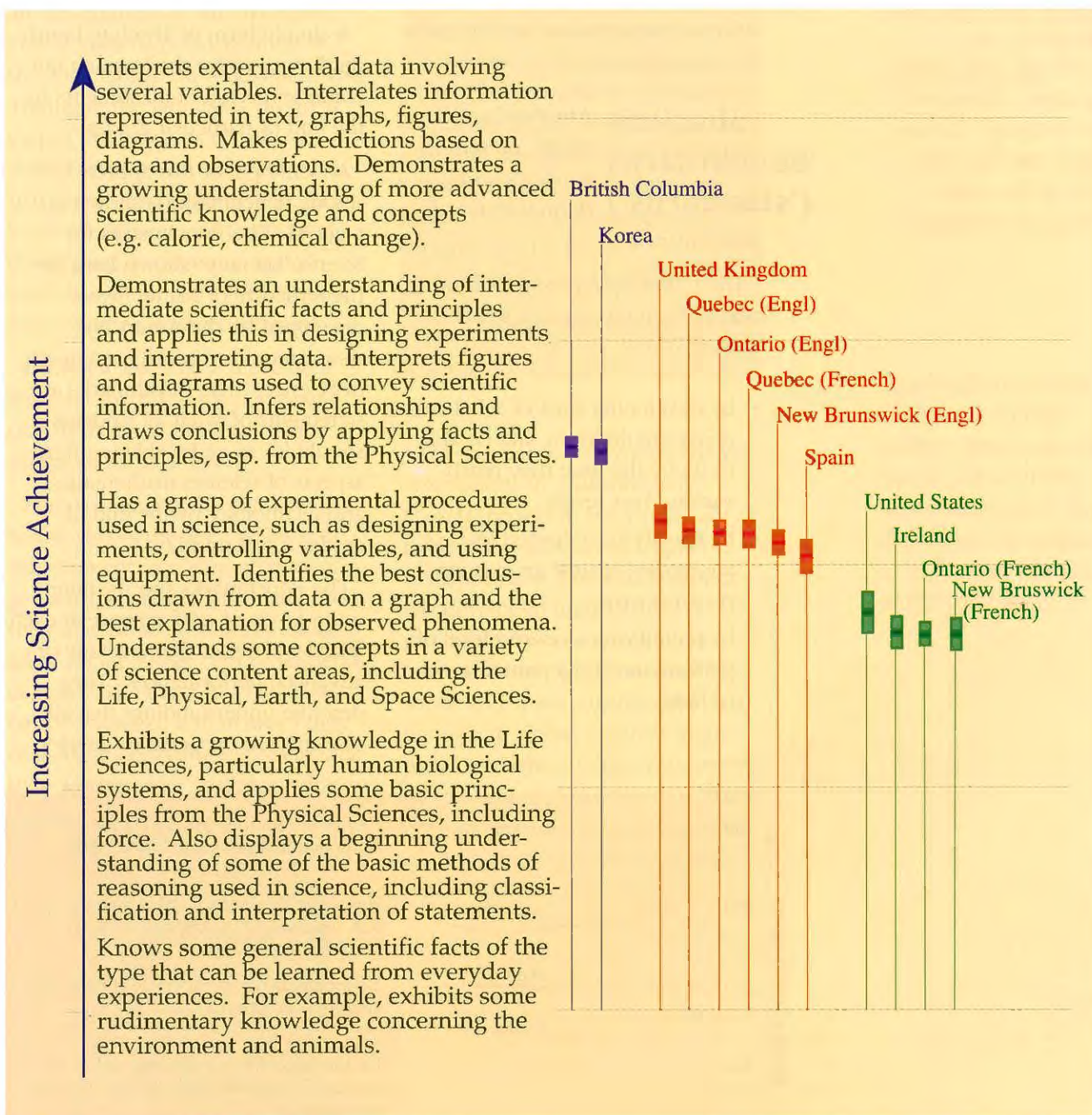
past performances

Comparative benchmarks also can be set by reference to past levels of performance:

- have levels of literacy achievement improved over time?
- how do levels of science achievement today compare with levels twenty years ago?

National and State surveys provide data which can be used to monitor changes in achievement levels over time.

One of the longest-running national surveys, the US National Assessment of Educational Progress (NAEP), assesses the achievements of 9, 13 and 17-year-olds in a variety of learning areas.



International surveys allow countries to compare student achievements (in this case the science achievements of 13-year-olds) with performances in other parts of the world.

It is informative to examine the National Assessment of Educational Progress trend results across the past two decades from two perspectives: Have levels of academic achievement been improving? Do more students now have the ability to reason and communicate effectively?²

Trends in average science achievement in US schools are shown below. Science achievement declined in the 1970s, but improved in the 1980s. At age 17, science performance in 1986 remained well below that of 17-year-olds in 1969.

A number of education systems monitor trends in student achievement, using past levels of performance as points of reference for studying progress and setting goals for improvement.

absolute benchmarks ('standards') Absolute benchmarks, or 'standards', describe desired levels of performance.

The following pages outline three ways of setting absolute benchmarks:

- by developing a list of what students should know and be able to do by the time they reach various Year levels;
- by specifying a desired level of attainment against an existing progress map;
- by identifying a desired level of performance on a particular set of tasks.

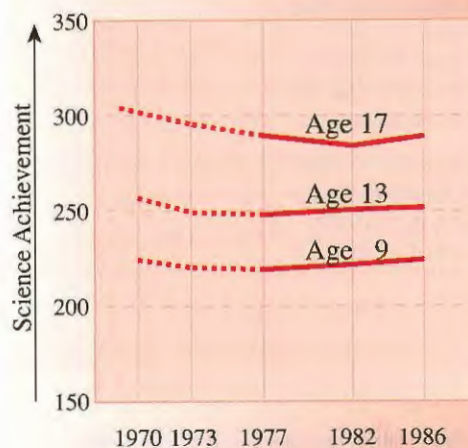
listed outcomes

Lists of desired learning outcomes are sometimes called 'content' standards. But lists of outcomes do not provide 'performance' standards (benchmarks) because they do not describe desired levels of performance in relation to outcomes or specify what students should achieve by the time they reach particular age or Year levels.

A simple form of absolute benchmarking is to list the learning outcomes expected of all students by the end of particular grades.

An example of this approach to setting benchmarks is shown on page 54. The Benchmarks for Science Literacy (shown here for the Structure of Matter) were developed by the American Association for the Advancement of Science.³ The Benchmarks are statements of what all students should know or be able to do in aspects of science, mathematics, and technology by the end of grades 2, 5, 8, and 12.

The Benchmarks specify minimum levels of performance at each Year level rather than average or advanced performances. They describe understandings that all students are expected to develop



Can infer relationships and draw conclusions using detailed scientific knowledge.

Has some detailed scientific knowledge and can evaluate the appropriateness of scientific procedures.

Understands basic information from the life and physical sciences.

Understands some basic principles, for example, simple knowledge about plants and animals.

Knows everyday science facts.

The US National Assessment of Educational Progress allows students' achievements to be compared with past levels of performance.

on the way to becoming science literate.

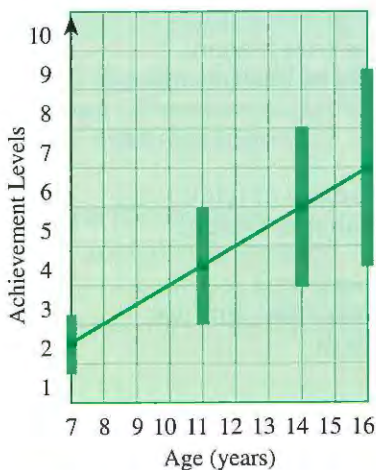
specified levels

A second approach to setting absolute benchmarks is to specify expected levels of achievement against a pre-constructed progress map.

The standards set for the National Curriculum Assessment in England are an example of this approach. Following a recommendation of the Task Group on Assessment and Testing in the late 1980s, progress maps ('progressions of achievement') were constructed for particular areas of school learning. Ten levels were proposed to describe developing competence and to provide a framework for assessing and reporting student progress.

Expected levels of achievement were set for 7, 11, 14 and 16-year-olds in terms of these described progressions and levels.

The dark line in the picture below shows the average level of achievement expected of students at each age. The vertical bars show the range of achievements expected of about 80 per cent of students at ages 7, 11, 14 and 16. The Task Group expected a narrower range of achievements among 7-year-olds than among older students, with



In England, expected levels of achievement were established for 7, 11, 14 and 16-year-olds.

the greatest variation expected at age 16.

Because the ten levels along this map describe developing knowledge, skills and understandings, the graphed expectations of 7, 11, 14 and 16-year-olds identify the kinds of learning outcomes expected of students at these ages.

Attainment targets will be set for the core subjects, establishing what children should normally be expected to know, understand and be able to do at around the ages of 7, 11, 14 and 16, so enabling the progress of each child to be measured against established national standards.⁴

Task Group on Assessment and Testing

The standards set by the *Graded Assessment in Mathematics (GAIM)* project at the University of London are another example of this approach. The *GAIM* project has developed mathematics progress maps consisting of 15 levels in four topic areas (number, shape and space, algebra, and data handling). These progress maps provide teachers with a framework for continuous assessment in mathematics classrooms, and with a set of mathematics activities aligned with *GAIM* levels.

A simple form of absolute benchmarking is to list the learning outcomes expected of all students by the end of particular grades.

'Benchmarks for Science Literacy specify how students should progress toward science literacy, recommending what they should know and be able to do by the time they reach certain grade levels.'



End of 12th grade (all students should know that:)

- Atoms are made of a positive nucleus surrounded by negative electrons. An atom's electron configuration, particularly the outermost electrons, determines how the atom can interact with other atoms. Atoms form bonds to other atoms by transferring or sharing electrons.
- The nucleus, a tiny fraction of the volume of an atom, is composed of protons and neutrons, each almost two thousand times heavier than an electron. The number of positive protons in the nucleus determines what an atom's electron configuration can be and so defines the element. In a neutral atom, the number of electrons equals the number of protons. But an atom may acquire an unbalanced charge by gaining or losing electrons.
- Neutrons have a mass that is nearly identical to that of protons, but neutrons have no electric charge. Although neutrons have little effect on how an atom interacts with others, they do affect the mass and stability of the nucleus. Isotopes of the same element have the same number of protons (and therefore of electrons) but differ in the number of neutrons.

End of 8th grade (all students should know that:)

- All matter is made up of atoms, which are far too small to see directly through a microscope. The atoms of any element are alike but are different from atoms of other elements. Atoms may stick together in well-defined molecules or may be packed together in large arrays. Different arrangements of atoms into groups compose all substances.
- Equal volumes of different substances usually have different weights.
- Atoms and molecules are perpetually in motion. Increased temperature means greater average energy of motion, so most substances expand when heated. In solids, the atoms are closely locked in position and can only vibrate. In liquids, the atoms or molecules have higher energy, are more loosely connected, and can slide past one another; some molecules may get enough energy to escape into a gas. In gases, the atoms or molecules have still more energy and are free of one another except during occasional collisions.

End of 5th grade (all students should know that:)

- Heating and cooling cause changes in the properties of materials. Many kinds of changes occur faster under hotter conditions.
- No matter how parts of an object are assembled, the weight of the whole object made is always the sum of the parts; and when a thing is broken into parts, the parts have the same total weight as the original thing.
- Materials may be composed of parts that are too small to be seen without magnification.
- When a new material is made by combining two or more materials, it has properties that are different from the original materials. For that reason, a lot of different materials can be made from a small number of basic kinds of materials.

End of 2nd grade (all students should know that:)

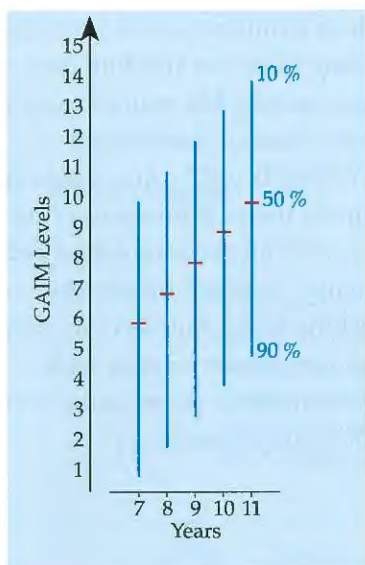
- Objects can be described in terms of the materials they are made of (clay, cloth, paper, etc.) and their physical properties (color, size, shape, weight, texture, flexibility, etc.).
- Things can be done to materials to change some of their properties, but not all materials respond in the same way to what is done to them.

The Benchmarks for Science Literacy list Structure of Matter outcomes expected at particular grade levels.

Within each topic (such as ratio, graphs, etc) a series of four to seven levels of attainment can be differentiated, and students appear to progress through these levels in a consistent way (i.e. even with seven levels, not more than 7% of students appear to have achieved one level without achieving all the levels below it).⁵

Margaret Brown

The picture below shows the levels of mathematics achievement expected of the top 90% of students, top 50% of students, and top 10% of students in each Year group. The mathematics knowledge and skills associated with these levels are described by *GAIM* criteria.



The *GAIM* project specifies the levels of mathematics achievement expected of 80% of students in each Year level.

task performances

A third approach to setting absolute benchmarks is to specify expected performances on assigned tasks:

- what is it reasonable to expect of Year 3 students on this task?
- what should all Year 5 students

be able to do on the same task?

- how would a competent electrician solve this set of problems?
- what should be the minimum level of performance on these tasks for certification as an airline pilot?

An example of this approach is described by Ellen Julian and Benjamin Wright using tasks constructed by the US National Board of Medical Examiners to assess the clinical competence of medical students.⁶ The Board uses computer-based patient simulations to assess levels of competence in clinical diagnosis and patient management.

One assessment task involves a 'patient' with a pneumothorax (air in the chest cavity). A committee of medical specialists identified 15 key actions in the management of this patient (nine beneficial actions and six risks) and considered what actions a competent physician would take. The task was administered to 275 third year medical students and resident physicians.

The various actions taken by students in managing this patient are calibrated along the map on page 57. (This draft progress map has been constructed in a 'bottom-up' way using medical students' performances.) The actions toward the bottom of the map are less appropriate actions and include risks to the health of the patient. The actions toward the top are actions competent physicians would take in managing the patient, including the early insertion of a chest tube to release the air.

On the left of the map, an 'X' marks the estimated level of competence of each of these 275 students based on their performances on this assessment task.

The dotted horizontal line is the

GAIM criteria are organised in strands illustrating the hierarchies of development of mathematical concepts.⁷



level judged to be the minimally acceptable level of performance in managing this patient: the level at which students typically do not take any of the actions identified as risks and request the insertion of a chest tube within the first 28 minutes of the case.

Three broad levels of competence are identified on the far left of the map: not yet competent, minimally competent, and highly competent. The actions typical of students at these levels can be read from the map and are summarised below.

Just as the absolute benchmark on this pneumothorax task is set by considering what a competent physician would do in response to each of a number of possible actions, a minimally acceptable score on a test or examination can be set by first identifying minimally acceptable responses to individual questions.

combined benchmarks

This article has considered comparative benchmarks, set by reference to the performances of others, and absolute benchmarks set by considering what it is that students should know and be able to do. But comparative benchmarking and absolute benchmarking can be carried out together.

The picture below shows the percentage of 8th grade students in each of a number of US States performing above an absolute performance standard in mathematics set by the National Assessment Governing Board.⁸ Any State can compare the performances of its students with the established performance standard (absolute benchmarking), but also can compare those performances with achievements in other States (comparative benchmarking).

A HIGHLY COMPETENT candidate will typically:

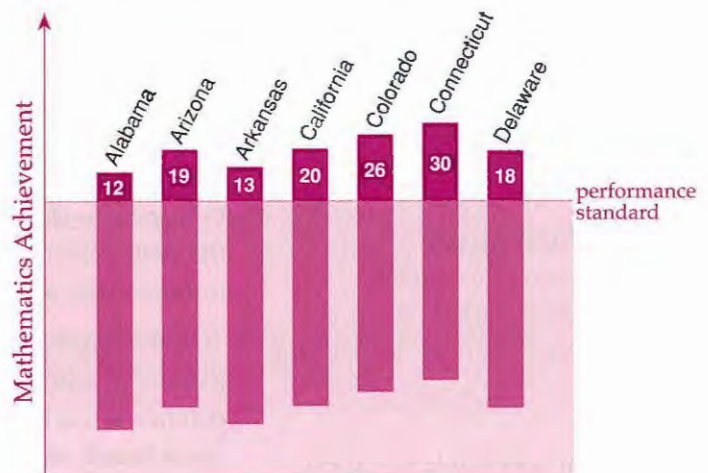
- request a chest tube in the first 13 minutes of the case;
- request a history *after* the tube;
- request a physical exam *after* the tube;
- request an x-ray *after* the tube;
- request arterial blood gases test *after* the tube;
- *not* request a needle thoracostomy (too small for this patient).

A MINIMALLY COMPETENT candidate will typically:

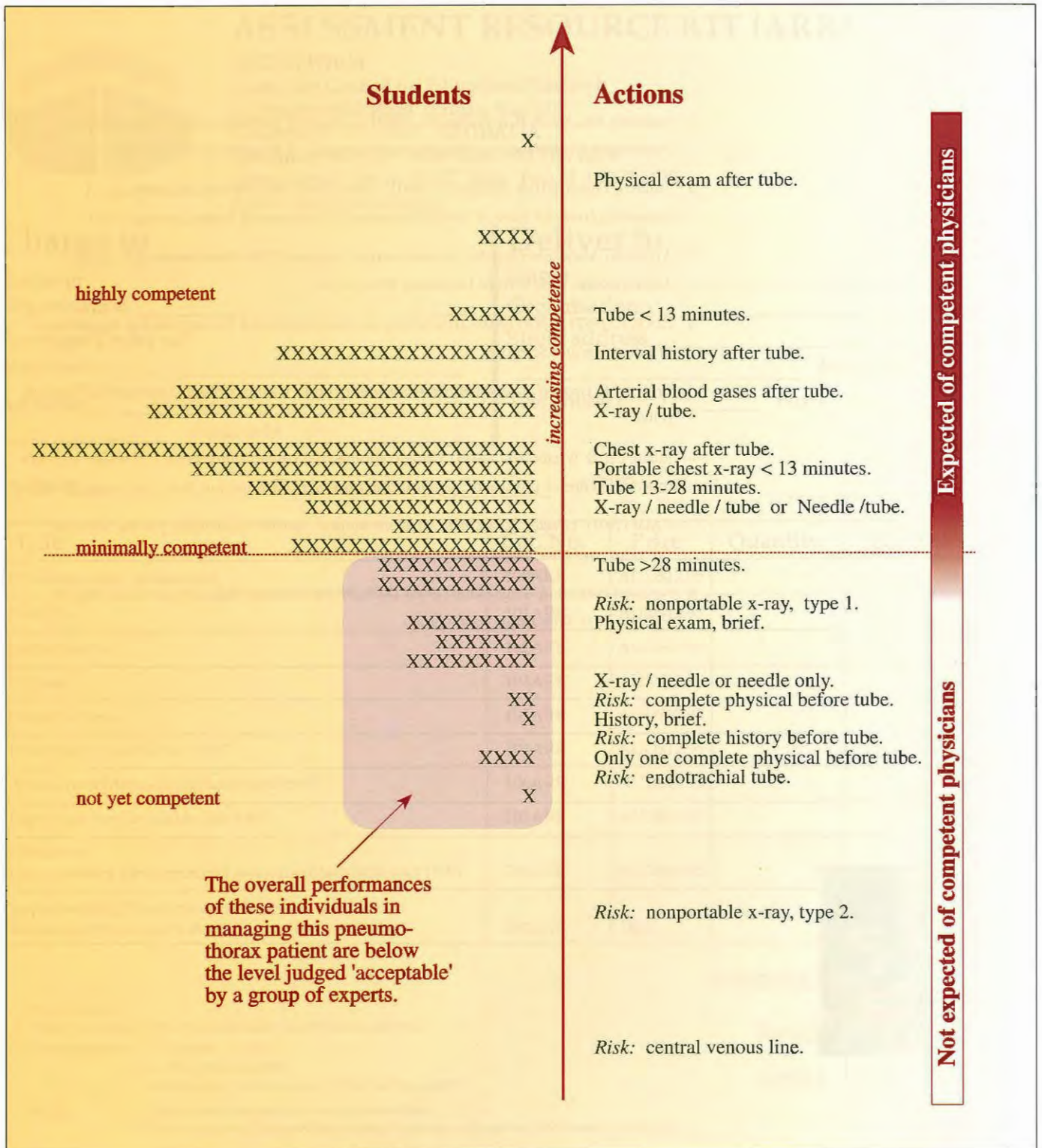
- request a chest tube, but possibly not in the first 27 minutes of the case;
- pursue the therapy pathway to at least a needle thoracostomy;
- conduct the relevant portions of a brief physical (but *not* a complete physical before the tube);
- take a brief history before the tube but *not* a complete one;
- *not* request a nonportable chest x-ray before the tube;
- *not* request an endotracheal tube;
- *not* request a central venous line.

A NOT YET COMPETENT candidate will typically:

- request a complete physical (possibly more than one!) before the tube;
- request a complete history before the tube;
- request an endotracheal tube;
- request a nonportable chest x-ray;
- not request a chest tube in the first 27 minutes.



The performance standard set by the National Assessment Governing Board allows both absolute and comparative benchmarking.



The calibration of actions along a map allows absolute standards to be set in terms of actions expected of competent physicians.

- 1 Lapointe, A.E., Mead, N. & Phillips, G. (1989) *A World of Differences: An International Assessment of Mathematics and Science*, Princeton, NJ: Educational Testing Service.
- 2 Mullis, I., Owen, E.H. & Phillips, G. (1990) *Accelerating Educational Achievement: A Summary from 20 Years of NAEP*. Princeton, NJ: Educational Testing Service, p. 30.
- 3 American Association for the Advancement of Science (1993) *Benchmarks for Science Literacy*, New York: Oxford University Press, p. XI.
- 4 Black, P. (1987) *Report of the Task Group on Assessment and Testing* London: Department of Education and Science.
- 5 Brown, M. *Graded Assessment in Mathematics* project, Kings College, University of London, p 108.
- 6 Julian, E.R. & Wright, B.D. (1988) 'Using computerized patient simulations to measure the clinical competence of physicians', *Applied Measurement in Education*, Vol. 1, No. 4, pp. 299-318.
- 7 GAIM (1991) *Graded Assessment in Mathematics: Teacher Assessment for the National Curriculum*, London: ULEAC.
- 8 National Education Goals Panel (1994) *Data for the National Educational Goals Report, Volume Two: State Data*, Washington.

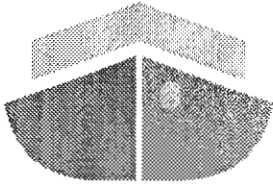


Please photocopy and fax or mail.

ASSESSMENT RESOURCE KIT (ARK)

ORDER FORM

Australian Council for Educational Research
19 Prospect Hill Road (Private Bag 55)
Camberwell Vic 3124 AUSTRALIA
Telephone: (03) 9277 5656 Fax: (03) 9277 5678
International: Tel: 61 3 9277 5656 Fax: 61 3 9277 5678
email: sales@acer.edu.au



Charge to

Name or Organisation _____
Purchase Order no. (if applicable) _____
Address _____
Postcode _____

Deliver to

Name _____
Organisation _____
Street address _____
Postcode _____
Telephone () _____ Fax () _____

Order date _____ Date required _____ ACER account no. _____

Title	Cat. No.	Price	Quantity	Total Price
Developmental Assessment	100ARK	AUD\$12.95		
Portfolios	101ARK	AUD\$12.95		
Performances	102ARK	AUD\$12.95		
Projects	103ARK	AUD\$12.95		
Progress Maps	105ARK	AUD\$12.95		
Products (available mid 1997)	104ARK	AUD\$12.95		
Assessment Methods (available late 1997)	106ARK	AUD\$12.95		
Paper and Pen (available late 1997)	107ARK	AUD\$12.95		
Videotape: Understanding Developmental Assessment (available mid 1997)	700ARK	AUD\$49.95		
Implementing Developmental Assessment: Workshop Manual & Videotape (available mid 1997)	500ARK	TBA		

SUBTOTAL

Freight

TOTAL \$

ADD FREIGHT:

Within Australia: 10% of invoice value, min \$5.00 max \$15.00.

Overseas(airmail): 1 - 5 copies: AUD\$25

6 - 10 copies: AUD\$40

More than 10 copies: please ring or fax for a quote.

NOTE:

Prepayment required for non-account orders.

Prices subject to change without notice - you are welcome to check before you order.

Please add my name and address to the mailing list for further information about ARK materials when they become available.

CHARGE: Account Cheque Enclosed (AUD\$)

Bankcard Mastercard American Express Visa

□□□□ □□□□ □□□□ □□□□



Name (please print) _____ Signature _____ Expiry date _____

Progress Maps is one in a series of magazines in the ACER Assessment Resource Kit (ARK).

This video and magazine resource provides information about assessment issues and methods.

For further details about other magazines, videos and the workshop manual in this series contact the Australian Council for Educational Research, 19 Prospect Hill Road, Camberwell, Victoria, Australia, 3124.

Phone: +61 3 9277 5656

Facsimile: +61 3 9277 5678

