Review of Michigan's Grade-Level Content Expectations
Achieve, Inc.
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In 1995, Michigan adopted "model core academic curriculum content standards" to establish a common set of expectations for all Michigan school children. The *Michigan Curriculum Framework* was published in 1996 to communicate these expectations to Michigan educators and provide them with tools for aligning curriculum and classroom practice with the state standards.

In 2002, the State Board of Education asked the Department of Education to develop grade-by-grade "content expectations" in reading/English language arts and mathematics to provide clearer guidance to local educators and parents and serve as the basis for annual assessments required by the federal No Child Left Behind Act (NCLB) of 2001. Committees of Michigan educators were assembled to develop the grade-level expectations, and as that work progressed, the new content expectations were subjected to a process of scholarly reviews to help ensure the resulting content expectations would be among the best in the nation.

In July 2003, Governor Jennifer Granholm and Superintendent Tom Watkins asked Achieve to conduct an external review of the draft English language arts and mathematics content expectations, comparing them with the best standards from other states and nations and providing recommendations for improvement. Achieve sent our review of the July drafts to the governor and superintendent in mid-August. After revisions were made to the content expectations in September, Achieve was asked to review the new drafts. This report summarizes Achieve's review of the most recent versions of the Michigan English language arts and mathematics content expectations.

In undertaking this review, Achieve contracted with content experts from around the nation that have exceptional expertise in their subject areas and extensive experience in evaluating standards and assessments. Their reviews were based on a comparison of Michigan's content expectations with standards from other states and nations that Achieve considers to be the best in the world. (See page 14 for a list of Achieve reviewers and benchmark standards.)

Achieve's Criteria for High-Quality Standards

Achieve judges the quality of expectations for student learning on the basis of the following criteria:

- **Rigor**: **What is the level of intellectual demand of the standards?**
  Expectations for student learning should be sufficiently intellectually challenging to equip students with the knowledge and skills they will need to succeed at the next level. Rigor is a measure of how closely the standards represent and build on the essential core content of a discipline — its key concepts and the ways they are related to one another. Rigor is the most complex of the criteria used to evaluate standards, since it depends on the interplay of the content chosen for emphasis, how thoughtfully knowledge and skills are sequenced from grade to grade, and the precision with which expectations for learners are expressed — all as compared with state and international benchmarks.

- **Clarity: Are the standards clearly written and presented in a logical, easy-to-use format?**
  Clarity requires more than just plain and jargon-free prose. Grade-level expectations must be communicated in language that can gain widespread acceptance by teachers, parents, school boards and others who have a stake in schooling. A straightforward format, based on the structure of the discipline, facilitates user access and makes grade-level comparisons transparent.

- **Specificity: Are the standards specific enough to convey the level of performance expected of students?**
  High-quality standards provide a sufficient amount of detail without being overly prescriptive and without becoming unmanageable for teachers. Overly broad standards leave too much open to interpretation, increasing the likelihood that students will be held to different levels of performance. Overly detailed standards encourage a checklist approach to teaching and learning that undermines students' overall understanding of the discipline. Furthermore, standards that have a relatively consistent level of precision (or "grain size") are easier to understand and use.

- **Focus: Have choices been made about what is most important for students to learn?**
  High-quality standards establish priorities about the concepts and skills that should be emphasized at each grade level. Choices should be based on the core knowledge and skills essential for students to advance to the next level of understanding. A sharpened focus also helps ensure that the amount of content to be learned in each grade level is manageable.

- **Progression: Do knowledge and skills build clearly and sensibly on previous learning and increase in intellectual demand from year to year?** Development of coherent understanding in a subject area requires a carefully staged evolution of knowledge and skills, moving from the simple to the complex and from the concrete to the abstract. Standards must reflect this development. They must grow more intellectually challenging from grade to grade, and they must delineate a progression of knowledge and skills, rather than repeating concepts from year to year.

On its face, it may seem that the work involved in developing high-quality standards is more trouble than it is worth. But in a standards-based system, curriculum, assessments, professional development, school progress reports, and, most important, day-in and day-out instruction are heavily dependent on standards. When the standards themselves are flawed, achieving quality in related components of the system is a formidable task; when the standards provide a compelling framework, the ultimate goal of improving teaching and learning is far more achievable.

Findings: English Language Arts

Achieve submitted its analysis of the July 2003 draft content expectations to Michigan in mid-August. Taken as a whole, the July draft of the English language arts indicators sets forth a thoughtful and compelling vision of literacy. The indicators functioned well as broad goals but not as explicit grade-level standards, which must provide clear guidance for instructional planning and assessment. Nor did they provide teachers and parents with a clear understanding of what students should know and be able to do.

Achieve made several recommendations for improving the grade-level expectations:

- Consider restructuring the content expectations;
- Describe a clear and consistent progression of knowledge and skills from grade level to grade level, eliminating unnecessary redundancies;
- Strengthen the strands that were too vague in communicating the state's expectations to educators and the public, notably writing, listening and speaking; and
- Include some stage setting at each grade to highlight the range of activities in which students will be involved.

Since that time, further revisions have been made and Achieve is now of the opinion that Michigan's grade-level content expectations in English language arts are of such quality that they can be considered among the best in the nation**.**

Rigor

Overall, Achieve found the placement of content in the July draft of the Michigan content expectations to be appropriate. Michigan tended to introduce important reading and other language arts topics in grade levels that are similar to the benchmark documents from California, Massachusetts, New Standards and Texas. However, two other critical aspects of rigor — a clear delineation of how knowledge and skills develop from one grade to the next and a consistent use of precise language in describing grade-by-grade expectations — were judged to be weak. The new version of the content expectations thoroughly addresses both of these weaknesses, and as a result, the level of demand of the Michigan content expectations in English language arts is on par with Achieve's benchmark standards.

Focus

Achieve praised the July draft of the Michigan grade-level expectations for both reflecting sound and appropriate choices about what is most important for students to learn and keeping the amount of content found in the expectations reasonable and manageable. What was lacking was a more carefully constructed framework for presenting the content expectations that would strengthen their focus and coherence. The structural changes Michigan has made to its documents have responded to that concern by enabling readers to trace the development of topics across the grade levels.

Clarity

Michigan's grade-level expectations are now quite clear, having been reorganized into four discreet sections — reading, writing, speaking and listening/viewing. Important for the expectations organizational clarity were the additons within each section of subcategories.

- Reading (21 expectations at each grade K–8)
  - Word Recognition
  - Narrative Text
  - Informational Text
  - Comprehension
  - Metacognition
  - Critical Standards
  - Reading Attitude
- Writing (10 expectations at each grade K–8)
  - Writing Genres
  - Process
  - Personal Style
  - Grammar and Usage
  - Spelling

Handwriting
Writing Attitude

Speaking (6–8 expectations at each grade K–8)
Conventions
Spoken Discourse

Listening/Viewing (9–10 expectations at each grade K–8)
Conventions (Interpersonal Processes)
Response

The addition of such organizing frames provides a structure to the document and to the various domains that makes the state's expectations much more accessible to the reader.

Specificity

One of the more significant weaknesses that Achieve pointed to in the July draft of the English language arts content expectations was a lack of specificity and precision. This lack of precision led to a lack of progression, with some standards simply repeating from grade to grade. In the new content expectations draft, Michigan has successfully clarified at all grade levels the expectations for reading, language skills, spelling and writing, thereby providing the state's classrooms clear goals for their students. Such clarifications also have helped to reduce the number of unnecessary redundancies that were present in the earlier draft.

In the July draft, the term "grade-level appropriate," was frequently used to describe vocabulary and reading levels without any further definition or clarification to help educators and parents distinguish among those skills at particular grade levels. As Achieve noted in the August review, "A central purpose of setting grade-specific standards is to define exactly what *is* grade-level appropriate, otherwise it is easy to imagine immense differences existing from district to district, school to school and even teacher to teacher within a single school."

Nowhere is this issue more important than in determining what constitutes grade-level reading materials, since it is always the case in describing reading skills that the difficulty level is dependent on the complexity of the reading passages to which the skills are applied. Michigan has come up with a series of interconnected resources — the Lexile system, the Dolch basic sight vocabulary for grades K–3, ReadingKey.Com and lists of suggested authors — that, taken together, fully develop the meaning of grade-level text. A brief description of each resource helps to explain the role each plays in making the meaning of grade level explicit.

The Lexile system codes grade-level text, specifying the range of readings appropriate for at least half the students at a given grade level, with the weakest students falling below the range and the best readers reading above the specified range. The system categorizes

text for grades 1–8 with the overall scale extending from 200L for grade 1 to 1100L at grade 8 . Lexile provides guidance about how to match students with texts, specifically, how to match students with increasingly demanding texts as their reading skills improve, with the expectation that students will be reading progressively more challenging texts as the school year proceeds. Consequently, whenever the expectations indicate that the students are reading grade-level texts, the implication is that the students are reading texts matched to their level, as defined in the Lexile system.

Michigan's revised content expectations also provide specific guidance to teachers regarding grade-level vocabulary. The document references the Dolch basic sight vocabulary for grades K–3 and further directs teachers to ReadingKey.Com — a Web site with useful information regarding vocabulary recommended for every grade level.

In addition, Michigan acted on Achieve's suggestion that reading levels could be made more exact by listing titles or by making reference to lists of grade-appropriate texts. It has adopted the lists of suggested authors developed originally by the *Massachusetts English Language Arts Curriculum Framework*, 2001, in consultation with *The Horn Book*.

Michigan deserves credit for its resourceful response to the very difficult issue of determining grade-level appropriateness in reading. The combination of the Lexile system, the Dolch list, ReadingKey.Com and the recommended authors lists will help to ensure a transparent, fair and equitable standard of expectation for Michigan students.

Progression

Constructing grade-level standards that assure the clear and consistent progression of skills and knowledge across the grade levels, while minimizing redundancy, is a great challenge in the area of English language arts. Achieve's review of the July draft content expectations cited a lack of progression as a central weakness in the document. This criticism centered on four elements: the use of "grade-appropriate" to differentiate demands in many standards; a tendency to repeat standards across grade levels with only minor differences in wording; a tendency to "bury" the progression in parentheses or examples; and a tendency for the level of difficulty of an expectation to shift from higher order at an early grade level to lower order at a later grade level.

In general, all of these criticisms have been addressed in the recent draft. Additionally, the new draft also includes an invaluable appendix — a series of matrices in which all of the standards are laid out grade by grade so that the progression of each skill is obvious to all readers. Achieve recommends that these matrices become a central part of the state's content expectations.

Recommendations for Improvement

The only major recommendation that remains for improving this document has to do with formatting. Some numbering system or method of identifying the various expectations will facilitate discussions of the materials and make references to specific standards much easier.

The state also may wish to consider using some of the quite elegant introductions that were a part of the 1996 framework document to introduce its new content expectations document and provide the appropriate context for teaching and learning.

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A Final Note

The Michigan English language arts committee has addressed all of the major recommendations made by the Achieve reviewers. A significant amount of care and intellectual energy went into the revisions of the content expectations within a very short timeframe. When this document reaches its final publication form, it will serve Michigan educators and children well. It also should serve as a model for other states.

Findings: Mathematics

In July 2003, Achieve reviewed Michigan's draft grade-level content expectations in mathematics, comparing them with national and international benchmarks. Achieve's reviewers found a number of shortcomings, most prominently a lack of clarity and specificity. Other weaknesses identified in the review included:

- A slow pace that is well behind national and international benchmarks;
- Insufficient attention to intellectual development and mathematical connections;
- Inadequate emphasis on the kind of problem solving that gives mathematics meaning;
- Inconsistent grain size of different standards; and
- Lack of attention to the appropriate roles and responsible uses of calculators.

Michigan's new Mathematics draft grade-level content expectations represent a major advance over the previous framework and content expectations. The expectations are more thorough, better organized and noticeably richer in mathematical detail. The matrix structure of strands, standards, estimated times, subpoints and remarks helps enormously to clarify intentions. The new content expectations seek to be very explicit, and in most respects they are clearer than the documents they are intended to replace. As important, they aspire to a rigorous mathematical level that is consistent with the best that Achieve has identified among other state and national standards.

However, it also is clear that these content expectations do not yet realize their full potential. They lack supporting examples and are uneven in both detail and clarity. Nonetheless, the new content expectations provide an innovative framework that, when refined and completed, would offer Michigan a powerful guide for mathematics in grades K–8.

Rigor

What students learn in the classroom depends on what and how they are taught. Thus to ensure that all students benefit from the empowerment offered by strong mathematics, Achieve makes its top priority curricular rigor — by which we mean the pacing, content and balance of expectations as benchmarked against state and national exemplars.

Reviewers of the July draft of the content expectations expressed concern over the expectations' relatively slow pace. Michigan's new content expectations advance the pace considerably. Although there are distinct differences between these content expectations and Achieve's national and international exemplars, the level of mathematical content that

students are expected to master in the Michigan content expectations is on par with the best standards from other states and nations.

As a partner state in Achieve's Mathematics Achievement Partnership, Michigan officials were particularly interested in how the state's new content expectations compare with Achieve's internationally benchmarked 8th grade standards outlined in the document *Foundations for Success*. The news here is quite good. With the exception of a few advanced topics, the Michigan content expectations require students to reach a comparable level of achievement to that outlined in Achieve's standards.

There is, however, an aspect of rigor that the Michigan content expectations do not yet adequately address, that is, striking the balance among procedural fluency, conceptual understanding and flexible reasoning that is so critical for mathematical proficiency. In its August review, Achieve urged that each of these be more aggressively developed from the earliest grades to foster deep mathematical understanding from grade to grade.

Michigan's new content expectations go part way toward addressing this concern, but there is room for additional improvement. Although addressed in the language of the standards, both conceptual understanding and reasoning may not adequately be conveyed. Simply stating that students should be able to solve problems or understand concepts may not ensure that teachers make this a priority. Mathematically strong teachers will likely be able to use these content expectations to create a rigorous program. However, K–8 teachers who have had minimal preparation in mathematics may read these content expectations literally, teach them narrowly, and thus leave students with mainly procedural skills and little conceptual understanding.

It is difficult to solve this problem by simply rewording the content expectations, although there are some areas in which this might help. In our experience, one of the best ways to address this issue is to include in the standards examples of problems that illustrate the level of reasoning and conceptual understanding that should be expected of students at each grade level.

There is another area in which sample problems could help strengthen these content expectations, as well — in illustrating the interconnectedness of the mathematical strands. Notwithstanding the disjointed appearance of lists of standards, mathematics is a highly integrated subject whose numerous internal connections are the source of its great power. Making connections, not mastering lists, is what helps children learn. It is a challenge for any standards document, written as a series of lists, to reveal crosscutting connections. This is a difficulty with which many other states have struggled but for which few have found adequate solutions. By including sample problems that require students to draw on knowledge across strands, the Michigan content expectations can help convey this important characteristic of mathematics.

Focus

Another of Achieve's major criteria for quality mathematics programs is focus — the degree to which the standards cohere around important core topics. Core topics in a well-focused program will be linked to each other, important topics outside the core and the world outside mathematics.

The Michigan content expectations differ from many other state standards in placing predominant emphasis on the content in the Number strand, both as a skill of value by itself and as a foundation for Algebra. Expectations in Number are substantive and explicit; nearly all require manual or mental (rather than computer or calculator) calculation. A notable strategic decision in the Michigan content expectations is that the foundations of Algebra are embedded in Number throughout the primary grades (rather than being a separate Algebra strand as is done in many other standards). This decision seems to serve its intended purpose well.

One consequence of this strategy is that data analysis and geometry are not treated as prominently in the early grades in Michigan as they are in other states. In fact, Data (including measurement, data analysis and probability) is the least emphasized strand in the new Michigan content expectations, occupying less than 10 percent of the time in grades 3–8. If the state wanted to put more emphasis on data without adding significantly to the Data strand, it could add subpoints and remarks in the Number strand that highlight the close link between Number and Data. This is another issue that sample problems could help address.

Progression

Topics in a well-focused program will be taken up in a carefully planned sequence that increases steadily in cognitive demand from grade to grade with minimal repetition. This was noted as a problem in the July draft content expectations.

The new content expectations fare much better in this regard. Topics appear to be sequenced in a logical order that ensures appropriate prerequisites, and movement from elementary to advanced concepts is reasonably clear. Moreover, to avoid unproductive repetition, standards are grouped in a way that has virtually no redundancy across grades. This arrangement enables each topic to be studied in sufficient depth for initial mastery. It is worth pointing out, however, that as a consequence of this careful sequencing grade-level gaps sometimes separate the study of closely related topics. This is simply a trade off that Michigan should be aware of.

Clarity and Specificity

It is difficult to overemphasize the importance of clarity and specificity in a standards document. Clarity requires more than just intelligible language. Standards need to be specific enough to be understood but not too fine-grained. Their purpose needs to be clear. Careful organization and judicious use of examples enhance understanding. Finally, clarity about the role of technology is especially crucial to understanding standards and expectations in mathematics.

In terms of clarity and specificity, Michigan's new content expectations represent a huge step forward compared with the July draft. In most cases, the new content expectations are both more understandable and more specific. The new matrix structure with columns for "Sub Points" (that clarify the standards) and "Remarks" (concerning advice to teachers) contributes greatly to this added clarity. For example, the broad standard 7 in grade 3 ("Know and use common units of measurement ...) is elaborated with subpoints that name particular units and several remarks to teachers that provide supplementary information in regard to abbreviations, mixed units and other useful details.

In the July draft, reviewers expressed concerns about the variation in grain size among the content expectations. Since that time, Michigan has added a "Number of Days" column indicating the approximate amount of time to be devoted to each topic, which serves to make the uneven grain sizes intentional and explicit. There is still the risk, however, of equating mountains and molehills (e.g., standard 1.3 requires 32 days, whereas standard 2.5 requires just 1 day) if parents or teachers see lists of expectations separated from the number of recommended days (as they may, for instance, in news coverage or district mailings). In addition, there are cases in which two standards that are intended to take the same amount of instructional time differ significantly in grain size (e.g., standard 2.11, "solve simple word problems involving length and money," vs. standard 2.13, "recognize and name unit fractions up to 1/12"). This may be confusing for teachers. We, therefore, encourage Michigan officials to think carefully about the intended audiences for the content expectations and ensure that the proper contextual information is included.

Because calculation is central to life, education and work, Achieve recommended that the new content expectations be more forthright concerning expectations for numerical calculation by hand (on paper), with calculators (or computers) and through mental methods (both exact and approximate). As student testing becomes progressively more high-stakes, clarity about expectations for calculation becomes increasingly important. Teachers and parents need explicit, thoughtful and balanced expectations that address all aspects of the calculation that will be expected in adult life.

Michigan's new content expectations address this concern in three ways. Expectations for calculation by paper and pencil are made very explicit. Mental methods are stressed both for the purpose of achieving answers and as a strategy to help children understand how numbers are composed and decomposed. Calculators are excluded "except where explicitly included," which occurs in only three standards (6.25, 7.5 and 7.7), none of which is earlier than the end of grade 6. While few would question the wisdom of expecting children to learn arithmetic by hand, several Achieve reviewers question the wisdom of not also expecting that students learn proper use of calculators at every stage in their learning of mathematics.

Recommendations for Improvement

The new mathematics content expectations are considerably stronger than those in the July draft, and they represent a significant advancement over the previous curriculum framework. However, we encourage the state to take a few additional steps before considering work on these content expectations complete.

First, we strongly recommend that Michigan add rich examples of mathematics tasks and problems to illustrate (1) the complexity and depth of mathematics intended by these standards and (2) the connectedness of mathematics that escapes any listing of standards. This is an area in which Michigan's participation in Achieve's Mathematics Achievement Partnership (MAP) should be beneficial. Achieve is developing sample tasks aligned to the MAP standards for every grade level K–8. Given the relatively close alignment of the Michigan content expectations and the MAP standards, these sample problems should be useful to Michigan.

Achieve also recommends that the current draft of the Michigan content expectations undergoes another round of editing, informed by reviews from potential users, to simplify language and improve consistency of expectations. Although we understand that much work has been done in recent weeks to make these content expectations more polished, we believe that more needs to be done in some areas to make the language accessible to educators and parents. For example, although most of the standards would be clear to any parent, or teacher, some are written in language that could be understood only by someone with substantial mathematical training. Consider the following standards:

> 5.1: Understand that among whole numbers, the division $a \div b$ makes sense only when a is a multiple of b, and then $a \div b = c$ means exactly that $a = c \times b$.
>
> 5.2: If a is not a multiple of b, then the division $a \div b$ is no longer meaningful. We express it instead by division with remainder: $a = bQ + R$ where Q is a whole number and the "remainder" R is a whole number between 0 and $a - 1$.

In addition, some standards are simple and sweeping with clarifying subpoints (*5.19: Identify and use angles.*); others, equally simple and sweeping, contain no subpoints (*5.16: Solve word problems involving fractions.*). In contrast, others are lengthy and detailed (e.g., 6.23 and 8.13). In some instances, the distinction between a standard and a subpoint seems to be inconsistent. For example, in Algebra at grade 7, specifics are subpoints, whereas in Geometry at grade 8, comparable specifics are listed as separate standards.

We suspect issues such as these will come up when the document is shared with teachers and others. We encourage state officials to solicit such feedback from the field and make necessary modifications along these lines.

Last, as mentioned earlier, we encourage state officials to think carefully about the intended audience(s) for the content expectations and consider whether one size will fit all or whether some variations on the theme are needed. As valuable as the matrix format of the new draft may be — as a flexible tool for developing and portraying standards — this format does have some drawbacks. A trivial one is that its very size and complexity is not "user friendly." More substantive is a worry that if standards are cited alone, or published separately as a summary, the modifying influence of the subpoints and remarks will be lost. There is a concern that the use of separate columns for different kinds of modifications may leave unclear which items students (and schools) will be held responsible for (e.g., what will be assessed on the state exams). Finally, there also is a danger that the subpoints (where present) may be taken as a definition of the standard they are associated with, so that only these points will be taught by teachers or focused on by test developers. None of these concerns trumps the value of the matrix structure, but they do suggest issues that must be carefully managed if these content expectations are to be interpreted as their authors intend.

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A Final Note

In summary, Michigan's new mathematics content expectations are a significant step forward compared with the previous curriculum framework. They are rigorous, thoughtfully sequenced and written with considerable precision. If the issues above are successfully attended to, Michigan will emerge with content expectations that can rightfully be compared with the best in the world.

Achieve's Benchmark Standards

English Language Arts
Reviewers of Michigan's Final Draft 2003 K–8 Grade-Level Content Expectations in English Language Arts used the following Achieve Benchmark Standards: North Carolina, Texas and New Standards for early literacy and Massachusetts (2001) and California (1997) for grades K–12.

Mathematics

Reviewers of Michigan's Final Draft 2003 K–8 Grade-Level Content Expectations in mathematics used three sets of Achieve's Benchmark Standards: Singapore (2001), Massachusetts (2002) and Achieve's end of grade 8 expectations in *Foundations for Success* (2002).

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