CBER Explorations in Bi-national Education

Number 4

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***Elementary Curricula in Mexico and the United States: A Comparative Analysis of Content Standards and Objectives.***

*By John Petrovic*

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## Preface to the series

As we welcome a new century and a new millennium, dire predictions are being heard in education circles concerning the teacher shortage that U.S. schools will face in the near future. In the next few years, baby boomer teachers will retire in record numbers. To complicate matters, not enough young people are entering the profession. The pipeline leading from high school to the profession is far from full. This is especially true of Hispanic youth, many of whom leave school before having the option of entering teaching as a career.

But crises sometimes lead to opportunities. Such is the case of those states with large Spanish-speaking populations. Mexico has long been the most important source of Spanish-speaking immigrants to the United States. Recently, immigration from Mexico has begun to change. Once a phenomenon Limited to unskilled and semi-skilled workers, has begun to change. Among recent newcomers there are growing numbers of people from the urban areas of Mexico where educational opportunities are better. This change in the demographics of Mexican immigration signals an increase in immigrants from the professional and technical classes. Well-prepared professionals and technicians are corning to the United States to live and work. They have much to offer their new country.

Mexican teachers are part of this shift in immigration patterns. In contrast to previous generations of teachers, the Mexican teacher of today has undergone the equivalent of a four-year college education. The obvious difference between Mexican and U.S. teachers is that the former may not have a full command of the English language. They cannot, therefore, practice their chosen field in U.S. schools. In addition there appear to be critical gaps in the Spanish proficiency and literacy of U.S. teachers who are already credentialed as bilingual education teachers here. (Guerrero, 1999) As they acquire English, the growing number of Mexican teachers in our midst—teachers who are fully proficient in Spanish—is welcome news for bilingual education. Here is a new and untapped pool of teaching talent waiting in the wings and eager to prepare for teaching duties in the United States.

***Project Alianza***, one of the initial sponsors of this monograph series, focuses energy, resources, and attention on this new resource: "normalista" teachers educated in Mexican teacher colleges (normal schools), who reside in the U.S. and who aspire to re-enter the profession in the United States. The alliance, consisting of several universities, a national R&D organization, and a bi-national foundation, has taken on the challenge of reducing the structural, cultural, and linguistic obstacles that have precluded the integration of this new pool of teachers into U.S. classrooms as full professionals. With financial support from the W. K. Kellogg Foundation, the members of ***Project Alianza*** are working to overcome these obstacles. They expect to facilitate the certification and absorption of several hundred teachers who started their education in Mexico and hope to work here, after meeting all the requirements that are met by every other teacher in the states in which they expect to work. By pointing the way to a new form of international collaboration in education, ***Project Alianza*** will make an important contribution to diminishing the anticipated shortage of well prepared teachers in the U.S.[1]

When the opportunity was extended to the Center for Bilingual Education and Research to become one of the ***Project*** Alianza partners, we were delighted to participate. Bi-national collaboration in all levels of education between the U.S. and Mexico is one of our strongest interests. We see no reason why the problem of educating immigrant youngsters should fall solely on U.S. schools and teachers. We were aware, even before the ***Project*** Alianza effort began, that important players in the Mexican educational system were willing and able to help reduce the cultural and linguistic barriers to the adequate education of these students. When we reviewed the history of previous bi-national collaborations, we were surprised to learn that only a few isolated efforts had been made to bring together educators from both sides of the border, to engage in dialogue, and to develop spaces and opportunities in which to explore ideas for educating immigrant children more collaboratively and perhaps more successfully. To the extent that research, collaboration, and innovation have taken place, they have occurred almost exclusively within the United States. It was as if an implicit assumption existed that Mexicans had no cards in the matter and that our respective professional obligations ended on our sides of the border. Since we live and work along one of the most open borders in the world, it is difficult to explain why educators in the U.S. have shouldered the difficult task of educating these students without consulting or collaborating with colleagues who worked with them before they immigrated.

From these observations and concerns arose the idea of publishing a series of papers aimed at promoting a continuing bi-national conversation concerning this problem. We choose the term "Explorations in Bi-National Education" as the title of this collection. With three monographs currently in the series, the Center for Bilingual Education and Research (CBER) hopes to inform the dialogue over the nature of education in areas with substantial Hispanic concentrations and on the mutual obligations of sending and receiving countries to collaborate in meeting this challenge. By helping to arrange for the integration of Mexican *normalistas* into the U.S. teaching force, we hope that other issues will surface, and that researchers and scholars in both countries will rise to the challenge.

The role of CBER and Arizona State University in ***Project Alianza*** is the preparation of three policy related research/policy reports. Several of these will be part of our "bi-national explorations" series. It is our hope that they will be useful to policy makers and practitioners involved in these bi-national efforts.

The first of these monographs was a wide-angle view of the ways in which the U.S. and Mexico educate and credential teachers for the K-12 sequence. This report, *Mexican Normalista Teachers as a Resource for Bilingual Education in the U.S.: Connecting two Models of Teacher Preparation,* reviewed the Mexican system of teacher education and pointed out similarities and differences between the Mexican and U.S. models. In the course of gathering and assembling this information, we found, to no one's surprise, that the topic is more complex than first meets the eye. The Mexican model is national in scope and offers little variation. There is little or no variation between each of the Mexican states or regions among states or institutions. All teachers in Mexican *escuelas normales* follow essentially the same curriculum prescribed by the central government through the Secretaria de Educación Pública. The U.S. system—in reality a hydra's head of state systems—is as variegated as the American states. The role of colleges and universities is different in the two countries and the subjects and experiences stressed in each country also vary in major ways. Still, upon completing the task, it was clear that enough similarity exists, that there is a solid common base on which to build a unifying structure between the two systems.

The second report in the bi-national education series focused on the perplexing question of language proficiency of teachers. We explored the issue of whether Spanish-speaking bilingual education teachers in the U.S.

are sufficiently proficient and Literate in **Spanish** to function in the more demanding--and more promising —program models such as the dual-language or two-way programs of bilingual education. Michael Guerrero, author of the monograph Spanish *Language Proficiency of Bilingual Education* Teachers, made an important contribution by taking on a long-neglected question in bilingual education: what level of mastery in Spanish is required of bilingual education teachers in order to teach effectively in two languages? The results of his analysis are worrisome. While Guerrero's exploration does not give us a final and conclusive answer, it points to the need for major research and development work in this area. Based on Guerrero's analysis we can infer that Mexican teachers who obtained a full, college-level education in Spanish, have an important contribution to make to our field.

The third report in the bi-national education series, Josué M. González and Ana Garcia reported on conversations they held with the *normalista* teachers involved in the ***Project Alianza*** before they completed their studies and became credentialed in the United States. They sought to discover, in general terms, the *normalistas'* views about the teaching profession, the preparation of teachers, and the role of teachers in the community. This report revealed a high level of congruence between the Mexican trained teachers and their US.-reared counterparts involved in bilingual education programs. Nonetheless, some differences were detected and these may become more marked once the teachers enter U.S. classrooms and begin to practice the profession they interrupted, often for many years, as they sought a social and economic footing in this country.

In this the fourth of the series, our colleague John Petrovic now of the University of Alabama, begins the much needed task of comparing the curricula of public schools in the United States and those in Mexico. As was the case with the teacher education report, we were faced here with a difficult comparison since the K-12 curriculum is national in Mexico and thoroughly decentralized in the United States. By focusing on two key states with large Hispanic populations, Petrovic was able to identify differences and similarities in the curriculum objectives for math and language arts in the two countries. It is the first of many such analyses that should be carried out in order to pin down the differences between what bi-national children experience in one country and in the other. Much remains to be done in this critical area and we hope that our initial efforts will inspire others to continue the task.

## Editor's Acknowledgments

Many people have contributed to, or have encouraged the development of CBER's concept of bi-national education and the concept of a *border pedagogy* crafted expressly for the special needs of the U.S./Mexico border. They share our belief that education should not be constrained by borders and that educators must challenge the divisive nature of political borders by working together, across borders, in pursuit of their educative mission. Among those who have encouraged us to develop this idea were David Berliner, Dean of Education at Arizona State University; Margarita Calderón of the CRESPAR organization at Johns Hopkins University; and Graciela Orozco of the Mexican and American Solidarity Foundation in Mexico City. All of them have made important contributions to our work in this area.

We invited several colleagues to read our drafts and offer suggestions. They are named and thanked in the authors' acknowledgment page but I take the prerogative, as series editor, to acknowledge them as a group, and to acknowledge that we could not have completed the work without their help. We are indebted to Ashlea Deahl, Wayne Wright and Julie Coulter for assistance in line editing the text.

The staff of the Center for Bilingual Education and Research were outstanding in their support of writers, editors, and artists. To Pauline Stark, Administrative Assistant, muchas gracias por todo. Andrea Everette and Adriana Robles plunged into the intricacies of desktop publishing software from the day they walked into the office and never looked up from their screens until the work was done. They are valuable members of the CBER editorial team.

The W. K. Kellogg Foundation underwrote a substantial portion of the costs for writing and producing some of the volumes in the series. We greatly appreciate their support. Special thanks to Cuca Robledo and Lalo Villarreal of IDRA, the leaders of the ***Project Alianza***. They exercise leadership with warm support, lots of encouragement, and great humanity. In short, they are architects of this international learning community. Un abrazo para ustedes.

Finally, my heartfelt thanks to the many colleagues involved in the day-to-day work of ***Project Alianza***. Your views were critically important to us since you were the first customers. I thank you for providing valuable help as the writing unfolded and helping us fine tune the contents of several of the volumes in this series. Gracias, han sido muy amables con nosotros.

With all these friends and supporters we could hardly go wrong in any major way. Still, for those stubborn mistakes of commission and omission that remain, I take full responsibility.

Josué M. González, Series Editor
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[1] The ***Project Alianza*** partners are the Intercultural Development Research Association, Mexican and American Solidarity Foundation, Arizona State University (ASU), California State University at Long Beach (CSULB), The University of Texas - Pan American (UT PanAm), The University of Texas at San Antonio (UTSA) and Southwest Texas State University (SWT).

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At the Center for Bilingual Education and Research, I would like to thank Josut González, Director of the Center and editor of this monograph series, for his review of this document. I also thank Adriana Robles for her many hours of toil getting the document ready to go to print and for creating and recreating a number of the many tables in the document.

The final document is more precise and clear as a result of the input and help of the many people mentioned. Any remaining omissions or inaccuracies are owed completely to me.

# PREFACE



## ISSUE AND PURPOSE

Over the past two decades, the United States has experienced a new influx of immigrants. Today the foreign-born represent 10% of the population, the highest proportion in 50 years (U.S. Bureau of the Census, 1997). The vast majority of this immigrant population is Hispanic and nearly a third emigrated from Mexico (U.S. Bureau of the Census, 1997b). The children of these immigrants account in great part for the nearly 3.5 million limited-English-proficient students in U.S. schools (Macías, 1998). Given this high rate of immigration from Mexico, it is no surprise that nearly 73% of limited-English-proficient students are Spanish-speaking and 40% of them were born in Mexico (Fleischman & Hopstock, 1993). Fifty-five percent of the limited English proficient students in I<-12 public schools live in only two states; California and Texas (Macías, 1998).

Despite successful attempts to improve teacher expectations of minority students (f. Goldenberg & Sullivan, 1994; Miron, 1997), there is still a strong tendency in American schools to assess and define these children, especially language-minority children, in terms of what they do not know (e.g., limited English proficient). This deficit model leads to lower academic expectations of these students. Whether attributable to a misinterpretation or misunderstanding of behavioral styles, learning styles, or language patterns, lower teacher expectations for minorities is a deep-rooted problem (Harris, et al., 1997). This deficit model also seems to contribute to the over-representation of minority students in special education (Meier & Brown, 1994) and other compensatory services. For example, language minority students constitute a significant portion of the students served in Title 1 programs and these students are considerably over-represented (Puma, Jones, Rock, and Fernadez, 1993). Whether a reflection of their attitude toward minority students generally or toward students served in special programs, Puma et al. (1993) report that teachers were four times more likely to give students not participating in special programs the highest ratings on overall ability and achievement.

This problem stems, in part, from the fact that many teachers are ill-prepared to deal with language minority students. Nationwide, only 10% of teachers of limited-English students are certified in bilingual education and only 8% are certified in English as a Second Language (Fleischman & Hopstock, 1993). The shortage of teachers qualified to deal effectively with language minority students remains severe and is estimated between one and two hundred thousand, depending on the corresponding estimates of limited English proficient students (Fern, 1998). One source to fill this need is immigrant teachers from Mexico, called *normalistas* due to their training in Mexican "normal schools." A number of programs have been implemented to help these teachers gain teacher certification in the United States (Olivo, 1999).

By providing teachers, administrators, and teacher educators in U.S. schools with a better understanding of the Mexican elementary curriculum, this monograph will be a step toward that goal of understanding how Mexican immigrant children know when they arrive in U.S. schools. As Macias (1990) argues,

> U.S. educators and policymakers cannot account systematically for immigrants' prior school experiences because they know little about them, and educational decisions in student assessment, curricular planning, and instructional behavior are made without knowledge of these antecedent experiences. (p. 292)

In addition, this monograph is to begin the process of defining these students in terms of the strengths they bring with them from their prior educational experiences. The information here represents a sounder basis for making decisions on the placement of, and the educational experiences provided to Mexican immigrant students. Given that this monograph provides a comparison of curricula, it should have a broad audience. It can be used by:

1. *Normalistas* to get a better understanding of the curriculum in U.S. schools,
2. Teacher educators in curriculum and instruction working with *normalistas* to:
    a. Promote #1 above;
    b. Promote #1 above in a manner that draws on the extant curricular expertise of normalistas;

c. Provide a preparation experience that is in consonance with experiences in the Mexican teacher preparation programs (given that much of the teacher preparation curriculum draws specifically from the national I<-12 curriculum); and, more broadly, by

3. Elementary school teachers and administrators to appreciate and understand the previous educational experiences of many of their Mexican immigrant students.

Finally, the monograph has implications that are much broader than its focus on a limited number of grades and subjects. First, it can serve a much larger audience by providing a model and guide for other states to make similar comparisons to better serve their Mexican immigrant students. Second, it can also serve as a model for future comparisons of higher grade levels and other subject areas.

The reader should be aware of the Limitations of this monograph. It is a descriptive and comparative study—which quite purposefully avoids making judgments about what the content and objectives *should* be-of the content and objectives of curricula in Mexico and the United States. It covers two subject areas, mathematics and language arts, in the first through third grades. The intent here is to answer three very basic questions: What do educational agencies want children to learn (content)? Why (objectives)? What are the substantive differences in the answers to the first two questions between Mexico and the United States?

## Organization of the Monograph

Part I of the monograph opens with a brief overview of the standards movement in the United States. Whether or not this movement to develop national, "world-class" content standards will have any positive effect is debatable (f. Cuban, 1993; Darling-Hamrnond, 1994). Nevertheless, it has certainly induced state educational agencies to play a greater role in school curricula via the development of curriculum frameworks that draw heavily from content standards developed by various national organizations, such as the National Council of Teachers of Mathematics.

The principal goal of Part I is to provide a grade-by-grade overview of the content and objectives in math and language arts in the first through third grades in California and Texas. Part I is organized by grade level and each subject area is treated within each grade-level section. State curriculum frameworks and content standards are primary sources for this overview.

Part II provides an overview of the same information from the elementary curriculum in Mexico and is organized in the same way. The information used in this pan was gathered from the "plan and programs of study" authored by the Mexican Department of Education (1993) (Secretaria de Educación Pública) for elementary education. Mexico has a national curriculum and therefore the "plan and programs of study" is the functional equivalent to our state curriculum frameworks and content standards. It is important to note, however, that the Secretaría does not consider their "plan and programs of study" to be "standards" per se. They instead present "foci of instruction, study, and learning which are accompanied by a series of pedagogical/ methodological recommendations" (Balbuena, personal communication, May 24,2000). Nevertheless, these publications are not unlike curriculum frameworks and content standards in the United States. California's frameworks, for example, "include extended discussion about ways to unify important ideas into a few core themes" (Council of Chief State School Officers, 1995, p. 68).

This approach does not get at the variations on the national curriculum that occur from state to state or school to school within Mexico. But even here the Secretaria de Educación Pública has some influence and publishes several of the resources that introduce the variations. For example, the Secretaría publishes different history/geography texts for each state, as well as language books for the many different indigenous groups throughout the country. The information presented in this section, drawn primarily from the plan and programs of study, is supplemented by information taken from textbooks, workbooks, and teachers' guides.

Part III provides an analysis of the major differences and similarities between the curricula in Mexico and the United States. Comparative analyses are provided for both subject areas at each grade level. I discuss the substantive differences in the curricular content and objectives. In this analysis, other important issues are highlighted, such as the sequence and scope of the content.

Part IV provides a brief summary of the monograph and suggests areas that require further research. While it is perhaps somewhat more than a prolegomenon, this monograph fills only a small space in a rather large area of research. The content here will be of interest to those people who need or want to know how similar or different the curricula in the United States and Mexico might be. Many, perhaps most, will be surprised at how similar

the curricula are, at least at these grade levels. While the content here will be useful to these people and some others, the true usefulness of this monograph in teacher education and the education of immigrant students is that it may represent a point of departure for future research.

I



## UNITED STATES CURRICULA AND STANDARDS

In 1983, the National Commission on Excellence in Education declared the United States a nation educationally "at risk" and claimed that "the educational foundations of our society are presently being eroded by a rising tide of mediocrity that threatens our very future as a nation and a people" (p. 5). Among the commission's recommendations was the adoption of more rigorous and measurable standards for academic performance. Whether we were then or are now in fact a "nation at risk" is highly doubtful (cf. Berliner & Biddle, 1995). Accurate or not, the commission's claims helped to usher in a national standards movement in education.

The commission was shortly followed by the creation of the National Education Goals Panel in 1990. The panel was formed in order to assess state and national progress toward achieving the national education goals developed and agreed on by the nation's governors. In 1994, Congress passed the Goals 2000: Educate America Act and the panel became a fully independent agency of the executive branch (National Education Goals Panel, 1995).

While Goals 2000 set very general goals, such as making U.S. students first in the world in mathematics achievement, other educational bodies were setting or revising content-specific standards. The National Council of Teachers of Mathematics (NCTM), for example, published a mo of documents —*Curriculum and Evaluation Standards for School' Mathematics* in 1989, *Professional Standards for Teaching Mathematics* in 1991, and *Assessment Standards for School' Mathematics* in 1995. The NCTM is now in the final stages of developing its *Principles and Standards for School' Mathematics* (NCTM, 1998).

Similarly, the National Council of Teachers of English, in conjunction with the International Reading Association, released its *Standards for the English Language Arts* in 1996. This document sets out 12 broad standards covering a number of skills such as reading a wide range of different text, using a variety of writing strategies, appreciating different cultures and languages, and applying knowledge of grammatical and spelling conventions. It also addresses six interrelated English language arts: reading, writing, speaking, listening, viewing, and visually representing.

These many national efforts have given impetus to ɒ redefined role for state education agencies that have increased their activity in educational decision making, especially vis-à-vis content and standards.[1] Most state educational agencies, either through mandates from state legislatures ɔs state boards ɑɛ education, ʎɒuɒ adopted curriculum frameworks. By 1994, 46 states had developed curriculum frameworks for math ɔs science ɔs both, and they are very consistent with the main content emphases and standards in the national reports mentioned (Blank and Pechman, 1995). More recently, the American Federation of Teachers (1999) reports that "every state except Iowaʎɒ]s] set ɔs [is] setting common academic standards ɛɑs students" in the four core areas of English, math, science, and social studies.[2]

Even though state standards tend to reflect ]ʎɒsɒ national standards ɒnd even usɒ them ɒs models, it would bɒ ɒ mistake to develop ɒ comparative analysis bɒsɒd on ]ʎɒsɒ national standards because state frameworks ʎɒuɒ bɒɒn developed in a very different context for ɒ more specific demographic. They emphasize some skills ouɒs others ɒnd even exclude other areas ɔs topics deemed important in national reports (Blank and Pechman, 1995). For this sɒɒson ɒnd in similar ways, the state frameworks also differ between states. Therefore, while national standards documents ɔɹɒ important to sʎɒd light on state frameworks, the comparison ʎɒsɒ draws directly from specific state frameworks. The focus ʎɒsɒ is on the two states with the greatest numbers of ELL's and Mexican immigrant students: California ɒnd Texas (Macías, 1998; Suarez-Orozco, 1998).

The following section details the content standards ɒnd objectives in mathematics and language arts in California and Texas. Since the standards in bo]ʎ states draw heavily from those developed by national professional organizations, they tend to overlap ɒ great deal. Therefore, the following sections draw from bo]ʎ the California ɒnd Texas content standards to develop ɒ "standards composite" that highlights the major categories of concentration in the respective curricula.

[1] Of course, these contributions to curricular standards by national organizations are not limited to math and language arts 1. There ɔxɒ such standards for most of the "major" content areas. As demonstrated by the number of national bodies producing standards and curriculum materials, math, along with science, is, perhaps, given the greatest attention. In science, the American Association for the Advancement of Science pubbsʎɒd *Science for All Americans* in 1989 and *Benchmarks for Science Literacy* in 1993. Both of these documents define the content and skills that should be mastered in science. Also, the National Research Council published its *National Science Education Standards* in 1995 after several years of development.

[2] Only Rhode Island has not set standards in all four of ]ʎɒsɒ areas, according to the AFT. Note that the AFT has set its own criteria bχ which to evaluate state standards. Reference to the AFT document should not bɒ interpreted as ɔn endorsement b χ this author of their criteria.

## State Content Standards

The Council of Chief State School Officers (1997) defines content standards as:

> The content knowledge and skills all students will know and be able to do upon completing particular grades or courses in K-12 education; the content standards state clearly the knowledge and skills to be learned, and at what developmental level content is to be presented. (On-line)

These content standards are included in a "curriculum framework" and every state in the United States has already developed or is in the process of developing such frameworks in core areas. The CCSSO (1997) defines a curriculum framework as:

> A document published by a state education agency or state board of education that generally includes desired subject content or standards for a core academic subject in K-12 education, and written by a team of content experts, state agency personnel, and local educators. A state framework often serves as a bridge between national professional standards and local curriculum and instructional agencies, and may address areas of pedagogy, classroom examples and vignettes, strategies toward equity, and important education policies and school conditions. (On-line)

In response to the Goals 2000 legislation, the California State Board of Education, as most other state boards, has begun its implementation of standards-based reform by adopting state content standards for mathematics, science, language arts, and history-social science. These content standards are the foci of the "curriculum frameworks" developed in each of these subject areas. To reiterate, these frameworks and their concomitant content standards are, in great part, modeled on the standards developed by various national organizations.

*Mathematics*

The California State Board of Education adopted its *Mathematics Content Standards for California Public Schools* in December 1997. The following year the board approved a new *Mathematics Framework for California Public Schools*. The Texas State Board has also adopted what it calls "learning standards." These standards are outlined in the *Texas Essential Knowledge and Skills* (1997).

Such content or learning standards identify "what all students in California public schools should know and be able to do at each grade level . . . [They] emphasize computational and procedural skills, conceptual understanding, and problem solving" (California Department of Education, 1999). The mathematics framework, in turn, "builds upon the mathematics standards and aligns the standards with the curriculum, instruction, resources for instruction, and assessment, resulting in a coherent and pragmatic plan for achieving high levels of mathematics proficiency for all students" (California Department of Education, 1998).

The California content standards for the elementary grades are organized by grade level and include five strands: number sense; algebra and functions; measurement and geometry; statistics, data analysis, and probability; and mathematical reasoning. With little variation, these are the same strands used by the NCTM in its standards. Texas divides its standards into six strands covering the same basic areas: number, operation, and quantitative reasoning; patterns, relationships, and algebraic thinking; geometry and spatial reasoning; measurement; probability and statistics; and underlying processes and mathematical tools.

The following sections summarize, primarily in tables, the mathematics standards in California and Texas for the first, second, and third grades. Each standard (in bold) is followed by several specific objectives designed to lead to realization of the standard. The tables are modeled on the California standards. A "•" indicates that the standard or objective is explicitly stated in the respective state curriculum framework or content standards. Where the corresponding Texas standard or objective is worded in a significantly different way or adds something not included in the California ones, it is included in brackets. There are several Texas standards and/or objectives that are not in California's and vice versa. A listed standard or objective that is not explicitly stated in one of the state standards is identified by a blank box in the appropriate column.

### *First Grade*

By the end of first grade, students should understand and be able to use the concept of ones and tens in the place value number system. They should be able to add and subtract small whole numbers with ease. They should be able to measure with simple units and locate objects in space, demonstrating spatial reasoning. They should be able to describe, organize, and analyze data, and solve simple problems.

Table 1 summarizes the objectives in the California and Texas standards for first grade mathematics.

## TABLE 1. Math (First Grade)

| *Content Standards and Objectives* | *CA* | *TX* |
|---|---|---|
| **Students understand and use numbers up to 100.** | • | • |
| Count, read, and write whole numbers to 100 [99]. | • | • |
| Compare and order whole numbers to 100 [99] by using <, >, =. | • | • |
| Represent equivalent forms of the same number through the use of physical models, diagrams, and number expressions (e.g., 8 may be represented as 4+4, 5+3, 10-2) [Identify patterns in related addition and subtraction sentences such as 2+3=5, 3+2=5.] | • | • |
| Count and group objects in ones and tens (e.g., three groups of 10 and 4 equals 34 or 30+4). | • | • |
| Identify and know the value of coins and show different combinations of coins that equal the same value. | • | • |
| **Students demonstrate the meaning of addition and subtraction and use these operations** to **solve problems.** | • | • |
| Know the addition facts (sums to 20) and the corresponding subtraction facts and commit them to memory. | • | • |
| Use the inverse relationship between addition and subtraction to solve problems. | • | |
| Identify one more than, one less than, 10 more than, and 10 less than a given number. | • | |
| Count by 2s, 5s, and 10s to 100. | • | • |
| Identify and know the value of coins and show different combinations of coins that equal the same value. | • | |
| Show the meaning of addition (putting together, increasing) and subtraction (taking away, comparing, finding the difference). | • | |
| Solve addition and subtraction problems with one- and two-digit numbers. | • | |
| Find the sum of three one-digit numbers. | • | |

| *Content Standards and Objectives* | *CA* | *TX* |
|---|---|---|
| Students use pairs of whole numbers to describe fractional parts of whole objects or sets of objects. | | ■ |
| Share a whole by separating it into equal parts and use appropriate language to describe the parts such as three out of four equal parts. | | ■ |
| Use appropriate language to describe the parts such as three out of four equal parts. | | ■ |
| Students use estimation strategies in computation and problem-solving that involve numbers that use ones, tens, and hundreds places. | ■ | |
| Make reasonable estimates when comparing larger or smaller numbers. | ■ | |
| Students use number sentences with operational symbols and expressions to solve problems. | ■ | |
| Write and solve number sentences from problem situations that express relationships involving addition and subtraction. | ■ | ■ |
| Understand the meaning of the symbols +, -, =. | • | |
| Create problem situations that might lead to given number sentences involving addition and subtraction. | • | • |
| Students use direct comparison and nonstandard units to describe the measurements of objects. | • | • |
| Compare the length, weight, and volume [capacity but not volume in TX] of two or more objects by using direct comparison or a nonstandard unit. | • | • |
| Tell time to the nearest half hour and relate time to events (e.g., before/after, shorter/longer). | • | • |
| Recognize temperatures such as a hot day or a cold day | | • |
| Describe the relationship between the size of the unit and the number of units needed in a measurement. | | • |
| Students identify common geometric figures, classify them by common attributes, and describe their relative position or their location in space. | • | |
| Identify, describe, and compare triangles, rectangles, squares, and circles, including the faces of three-dimensional objects. | • | • |
| Classify familiar plane and solid objects by common attributes such as color, position, shape, size, roundness, or number of comers, and explain which attributes are being used for classification. | • | • |

| *Content Standards and Objectives* | *CA* | *TX* |
|---|---|---|
| Give and follow directions about location. | • | |
| Arrange and describe objects in space by proximity, position, and direction (e.g., near, far, below, above, up, down, behind, in front of, next to, left or right of). | • | |
| Combine geometric shapes to make new geometric shapes using concrete models. | | • |
| **Students organize, represent, and compare data by category on simple graphs and charts.** | • | • |
| Sort objects and data by common attributes and describe the categories. | • | • |
| Draw conclusions and answer questions using information organized in real-object graphs, picture graphs, and bar-type graphs. | | • |
| Identify events as certain or impossible such as drawing a red crayon from a bag of green crayons. | | • |
| Students sort objects and create and describe patterns by numbers [odd, even], shapes, sizes, rhythms, or colors. | • | • |
| Describe, extend, and explain ways to get to a next element in simple repeating patterns (e.g., rhythmic, numeric, color, and shape). [Identify, describe, and extend patterns to make predictions and solve problems.] | • | • |
| Students make decisions about how to set up a problem. | • | • |
| Determine the approach, materials, and strategies to be used. [Use a problemsolving model that incorporates understanding the problem, making a plan, carrying it out, and evaluating the solution for reasonableness.] [Select or develop an appropriate problem-solving strategy including drawing a picture, looking for a pattern, systematic guessing and checking, or acting it out in order to solve a problem.] | • | • |
| Use tools, such as manipulatives or sketches, to model [solve] problems. | • | • |
| Students solve problems and justify their reasoning. | • | • |
| Explain the reasoning used and justify the procedures selected. | • | • |
| Make precise calculations and check the validity of the results from the context of the problem. | • | |

| *Content Standards and Objectives* | *CA* | *TX* |
|---|---|---|
| **Students note connections between one problem and another.** | • | |
| **Identify mathematics in everyday situations.** | | • |
| **Students communicate about Grade 1 mathematics using informal language.** | | • |
| **Students communicate about Grade 1 mathematics using informal language.** | | • |
| **Explain and record observations using objects, words, pictures, numbers, and technology.** | | • |
| **Relate informal language to mathematical language and symbols.** | | • |

As we can see, there is significant overlap in the Texas and California mathematics content standards and objectives in first grade. Note that there are four content standards in California that are not explicit in Texas and two content standards in Texas that are not explicit in California. Nevertheless, only **3** of the **13** content standards are not represented in some way (i.e., by having related objectives) in one or the other state.

***Second Grade***

By the end of second grade, students should understand place value and number relationships such that they can compare and order whole numbers. They should be able to apply addition and subtraction and use simple concepts of multiplication. They should begin to apply certain measurement processes, measuring quantities **with** appropriate units. They should be able to classify and describe shapes and see relationships among them.

## TABLE 2. Math (Second Grade)

| *Content Standards and Objectives* | *CA* | *TX* |
|---|---|---|
| Students understand the relationship between numbers, quantities, and place value in whole numbers up to 1,000. | ■ | ■ |
| Count, read, and write whole numbers to 1,000 [999] and identify the place value for each digit. | ■ | ■ |
| Use words, models, and expanded forms (e.g., 45 = 4 tens + 5) to represent numbers (to 1,000) [999]. | ■ | • |
| Order and compare whole numbers to 1,000 [999] by using the symbols <, =, >. | ■ | • |
| Students estimate, calculate, and solve problems involving addition and subtraction of two- and three-digit numbers[" three-digit numbers" not explicit in TX standards]. | • | - |
| Understand and use the inverse relationship between addition and subtraction (e.g., an opposite number sentence for 8 + 6 = 14 is 14 - 6 = 8) to solve problems and check solutions. [Select addition or subtraction and solve problems using mo-digit numbers, whether or not regrouping is necessary.] [Solve subtxaction problems related to addition facts (fact families) such as 8+9=17, 9+8=17, 17-8=9, 17-9=8.] | • | • |
| Find the sum or difference of two whole numbers up to three digits long. | ■ | |
| Use mental arithmetic to find the sum or difference of 2 two-digit numbers. [Recall and apply basic addition facts (sums to 18).] | - | • |
| Students model and solve simple problems involving multiplication and division. | ■ | • |
| Use repeated addition, arrays, and counting by multiples to do multiplication. | ■ | |
| Know the multiplication tables of 2s, 5s, and 10s (to "times 10") and commit them to memory. | ■ | |
| [Model, create, and describe multiplication situations in which equivalent sets of concrete objects are joined.] | | ■ |
| [Model, create, and describe division situations in which a set of concrete objects is separated into equivalent sets.] | | ■ |

| *Content Standards and Objectives* | *CA* | *TX* |
|---|---|---|
| Students understand that fractions and decimals may refer to parts of a set and parts of a whole. ["Decimals" not explicit in TX standards.] | • | • |
| Recognize, name, and compare unit fractions from 1/12 to 1/2. | - | - |
| Recognize fractions of a whole and pans of a group (e.g., one-fourth of a pie, two-thirds of 15 balls). [Name fractional parts of a whole object (not to exceed twelfths) when given a concrete representation] [Name fractional parts of a set of objects (not to exceed twelfths) when given a concrete representation.] | • | - |
| Know that when all fractional parts are included, such as four-fourths, the result is equal to the whole and to one. | ■ | |
| Students model and solve problems by representing, adding, and subtracting amounts of money. | - | • |
| Solve problems using combinations of coins and bills. [Determine the value of a collection of coins less than one dollar.] | ■ | ■ |
| Know and use the decimal notation and the dollar and cent symbols for money. | • | |
| Students use estimation strategies in computation and problem solving that involve numbers that use the ones, tens, hundreds, and thousands places. | • | |
| Recognize when an estimate is reasonable in measurements (e.g., closest inch). | • | |
| Students model, represent, and interpret number relationships to create and solve problems involving addition and subtraction. | • | |
| Use the commutative and associative rules to simplify mental calculations and to check results. | • | |
| Relate problem situations to number sentences involving addition and subtraction. | • | |
| Solve addition and subtraction problems by using data from simple charts, picture graphs, and number sentences. [Addition and subtraction not specified in the TX equivalent of this standard.] | • | • |
| Students understand that measurement is accomplished by identifying a unit of measure, iterating (repeating) that unit, and comparing it to the item to be measured. [Students recognize and use models that approximate standard units (metric and customary) of length, weight, capacity, and time.] | • | • |

| *Content Standards and Objectives* | *CA* | *TX* |
|---|---|---|
| Students demonstrate an understanding of patterns [in numbers and operations] and how patterns grow and describe them in general ways. | • | • |
| Recognize, describe, and extend patterns and determine a next term in linear patterns (e.g., 4, 8, 12; the number of ears on one horse, two horses, three horses, four hones). [Find patterns in numbers such as in a 100s chart. Use patterns in place value to compare and order whole numbers through 999. Identify patterns in a list of related number pairs based on a real-life situation and extend the list.] | • | • |
| Solve problems involving simple number patterns. | • | |
| [Use patterns to develop strategies to remember basic addition facts.] | | • |
| [Identify, describe, and extend patterns to make predictions and solve problems.] | | • |
| [Identify, describe, and extend patterns to make predictions and solve problems.] | | • |
| Students make decisions about how to set up a problem. | • | • |
| Determine the approach, materials, and strategies to be used. Use a problem-solving model that incorporates understanding the problem, making a plan, carrying out the plan, and evaluating the solution for reasonableness. | • | • |
| Use tools, such as manipulatives or sketches, to model [and solve] problems. [Select or develop an appropriate problem-solving strategy including drawing a picture, looking for a pattern, systematic guessing and checking, or acting it out in order to solve a problem.] | • | • |
| [Identify the mathematics in everyday situations.] | | • |
| Students solve problems and justify their reasoning. | • | • |
| Defend the reasoning used and justify the procedures selected. [Use logical reasoning to make sense of the world. Reason and support thinking using objects, words, pictures, numbers, and technology.] | • | • |
| Make precise calculations and check the validity of the results in the context of the problem. | • | |
| Students note connections between one problem and another. | • | |
| Students communicate about Grade 2 mathematics using informal language. | | • |
| Explain and record observations using objects, words, pictures, numbers, and technology. | | • |
| Relate informal language to mathematical language and symbols. | | • |

As in first grade, there is significant overlap in the second-grade mathematics content standards and objectives in Texas and California. Only 4 of the 13 content standards are not explicit in both states.

*Third Grade*

By the end of third grade, students will have deepened their understanding of place value and their understanding of and skill with mathematical applications including addition, subtraction, multiplication, and division of whole numbers. They begin to connect fraction symbols including decimals to fractional quantities and add and subtract simple fractions. Students should be able to estimate, measure, describe, compare, and classify shapes and solids. They should be able to represent number relationships and conduct simple probability experiments to verify predictions.

## Table 3. Math (Third Grade)

| *Content Standards and Objectives* | *CA* | *TX* |
|---|---|---|
| Students understand the place value of whole numbers. [Students use place value to communicate about increasingly large whole numbers in verbal and written form, including money.] | • | ▪ |
| Count, read, and write whole numbers to 10,000 [999,999]. | - | - |
| Compare and order whole numbers to 10,000 [9,999]. | - | - |
| Identify the place value for each digit in numbers to 10,000. | • | |
| Round off numbers to 10,000 to the nearest ten, hundred, and thousand. [Round two-digit numbers to the nearest ten and three-digit numbers to the nearest hundred.] | • | • |
| Use expanded notation to represent numbers (e.g., 3,206 = 3,000 + 200 + 6). | ▪ | |
| Students calculate and solve problems involving addition, subtraction, multiplication, and division. | • | ▪ |
| Find the sum or difference of two whole numbers between 0 and 10,000 [999]. | • | • |
| Model addition and subtraction using pictures, words, and numbers. | | • |
| Memorize to automaticity the multiplication table for numbers between 1 and 10. [Learn and apply multiplication facts through the tens using concrete models.] | • | • |
| Use the inverse relationship of multiplication and division to compute and check results. | • | |
| Use models to solve division problems, and use number sentences to record the solution. | | • |
| Solve simple problems involving multiplication of multidigit numbers by one-digit numbers. ["Multidigit" not specified in TX standards.] | • | • |
| Solve division problems in which a multidigit number is evenly divided by a one-digit number (135 ÷ 5 = __ ). | • | |
| Understand the special properties of 0 and 1 in multiplication and division. | • | |
| Determine the unit cost when given the total cost and number of units. | • | |
| Solve problems that require two or more of the skills mentioned above. | • | |

| *Contents Standards and Objectives* | *CA* | *TX* |
|---|---|---|
| Estimate sums and differences beyond basic facts. | | • |
| Students understand the relationship between whole numbers, simple fractions, and decimals. [Students use **fraction** names and symbols to describe fractional parts of whole objects or sets of objects.] | • | • |
| Compare fractions represented by drawings or concrete materials to show equivalency and to add and subtract simple fractions in context (e.g., 1/2 of a pizza is the same amount as 2/4 of another pizza that is the same size; show that 3/8 is larger than 1/4). ["To add and subtract . . . " not specified in TX standards.] | • | • |
| Add and subtract simple fractions (e.g., determine that 1/8 + 3/8 is the same as 1/2). | • | |
| Solve problems involving addition, subtraction, multiplication, and division of money amounts in decimal notation and multiply and divide money amounts in decimal notation by using whole-number multipliers and divisors. | • | |
| Determine the value of a collection of coins and bills. | | • |
| Know and understand that fractions and decimals are two different representations of the same concept (e.g., 50 cents is 1/2 of a dollar, 75 cents is 3/4 of a dollar). | • | |
| Use fraction names and symbols to describe fractional parts of whole objects or sets of objects with denominators of 12 or less. | | • |
| **Students select appropriate symbols, operations, and properties to represent, describe, simplify, and solve simple number relationships.** | • | |
| Represent relationships of quantities in the form of mathematical expressions, equations, or inequalities. | • | |
| Solve problems involving numeric equations or inequalities. | • | |
| Select appropriate operational and relational symbols to make an expression true (e.g., if 4 __ 3 = 12, what operational symbol goes in the blank?). | • | |
| Express simple unit conversions in symbolic form (e.g., __ inches = __ feet x ?12). | • | |
| Recognize and use the commutative and associative properties of multiplication (e.g., if 5 x 7 = 35, then what is 7 x 5 and if 5 x 7 x 3 = 105, then what is 7 x 3 x 5). | • | |
| Identify patterns in related multiplication and division sentences (fact families) such as 2 x 3 = 6, 3 x 2 = 6, 6÷2 = 3, 6÷3 = 2. | • | |

| *Content Standards and Objectives* | *CA* | *TX* |
|---|---|---|
| **Students represent simple functional relationships.** | • | |
| Solve simple problems involving a functional relationship between two quantities (e.g., find the total cost of multiple items given the cost per unit). | • | |
| Extend and recognize a linear pattern by its rules (e.g., the number of legs on a given number of horses may be calculated by counting by 4s or by multiplying the number of horses by 4). [Identify patterns in multiplication facts using concrete objects, pictorial models, or technology.] | • | • |
| Identify and extend whole-number and geometric patterns to make predictions and solve problems. | | • |
| Students use lists, tables, and charts to express patterns and relationships. | | • |
| Generate a table of paired numbers based on a real-life situation such as insects and legs. | | • |
| Identify patterns in a table of related number pairs based on a real-life situation and extend the table. | | • |
| Students choose and use appropriate units and measurement tools to quantify the properties of objects. [Students select and use appropriate units and procedures to measure length and area.] | • | • |
| Choose the appropriate tools and units (metric and U.S.) and estimate and measure the length [using standard units such as inch, foot, yard, centimeter, decimeter, and meter,] liquid volume, [capacity] and weight/mass of given objects. | • | • |
| Estimate or determine the area and volume of solid figures by covering them with squares or by counting the number of cubes that would fill them. [Use concrete models of square units to determine area of shapes.] | • | • |
| Find the perimeter of a polygon with integer sides. [Use linear measure to find the perimeter of a shape, but not volume.] | • | • |
| Carry out simple unit conversions within a system of measurement (e.g., centimeters and meters, hours and minutes). | • | |
| Students measure rime and temperature. | | • |
| Tell and write time shown on traditional and digital clocks. | | • |
| Use a thermometer to measure temperarure. | | • |
| Students describe and compare attributes of plane and solid geometric figures and use their understanding to show relationships and solve problems. [Students use formal geometric vocabulary to name, describe, and compare shapes and solids.] | • | • |

| *Content Standards and Objectives* | *CA* | *TX* |
|---|---|---|
| Identify, describe, and classify polygons (including pentagons, hexagons, and octagons). | • | |
| Identify attributes of triangles (e.g., two equal sides for the isosceles triangle, three equal sides for the equilateral triangle, right angle for the right triangle). | | |
| Identify attributes of quadrilaterals (e.g., parallel sides for the parallelogram, right angles for the rectangle, equal sides and right angles for the square). | • | |
| Identify right angles in geometric figures or in appropriate objects and determine whether other angles are greater or less than a right angle. | • | |
| Identify, describe, and classify common three-dimensional geometric objects (e.g., cube, rectangular solid, sphere, prism, pyramid, cone, cylinder). | • | |
| Identify common solid objects that are the components needed to make a more complex solid object. | • | |
| [The TX standards seem to incorporate all of the above but in much more general language: Students recognize congruence and symmetry, identify congruent shapes, create shapes with lines of symmetry using concrete models and technology, and identify lines of symmetry in shapes.] | | |
| Students recognize that numbers can be represented by points on a line and can locate and name points on a line using whole numbers and fractions such as halves. | | • |
| **Students conduct simple probability experiments by determining the number of possible outcomes and making simple predictions. [Students solve problems by collecting, organizing, displaying, and interpreting sets of data.]** | • | • |
| Identify whether common events are certain, likely, unlikely, or improbable. | • | • |
| Record the possible outcomes for a simple event (e.g., tossing a coin) and systematically keep track of the outcomes when the event is repeated many times. | | |
| Summarize and display the results of probability experiments in a clear and organized way (e.g., use a bar graph or a line plot). [Collect, organize, record, and display data in pictographs and bar graphs where each picture or cell might represent more than one piece of data.] | • | • |
| Use the results of probability experiments to predict future events (e.g., use a line plot to predict the temperature forecasts for the next day). [Interpret information from pictographs and bar graphs.] | • | • |

| *Content Standards and Objectives* | *CA* | *TX* |
|---|---|---|
| **Students make decisions about how to approach problems. [Students apply Grade 3 mathematics to solve problems** connected to everyday experiences and activities in and outside of school.] | • | • |
| Use a problem-solving model that incorporates understanding the problem, making a plan, carrying out the plan, and evaluating the solution for reasonableness. | | • |
| Analyze problems by identifying relationships, distinguishing relevant from irrelevant information, sequencing and prioritizing information, and observing patterns. | • | |
| Determine when and how to break a problem into simpler parts. | • | |
| Students use strategies, skills, and concepts in finding solutions. | • | |
| Use estimation to verify the reasonableness of calculated results. | • | |
| Apply strategies and results from simpler problems to more complex problems. | • | • |
| Use a variety of methods such as words, numbers, symbols, charts, graphs, tables, diagrams, and models to explain mathematical reasoning. | • | • |
| Use tools such as real objects, manipulatives, and technology to solve problems. | | • |
| Express the solution clearly and logically by using the appropriate mathematical notation terms, and clear language; support solutions with evidence in both verbal and symbolic work. [Explain and record observations using objects, words, pictures, numbers, and technology.] | • | • |
| Relate informal language to mathematical language and symbols. | | • |
| Indicate the relative advanrages of exact and approximate solutions to problems and give answers to a specified degree of accuracy. | • | |
| Make precise calculations and check the validity of the results from the context of the problem. | • | • |
| **Students move beyond a particular problem by generalizing to** other situations. | • | • |
| Identify the mathematics in everyday situations. | | • |
| Evaluate the reasonableness of the solution in the context of the original situation. [Justify why an anwer is reasonable and explain the solution process.] | • | • |
| Note the method of deriving the solution and demonstrate a conceptual understanding of the derivation by solving similar problems. | • | |
| Develop generalizations of the results obtained and apply them in other circumstances. [Make generalizations from patterns or sets of examples and non-examples.] | • | • |

**Again,** the overlap in the third-grade mathematics content standards and objectives is significant. Only 4 of the 12 content standards are not explicitly stated in both Texas and California. Two of these four "missing" standards are, in fact, represented by related objectives.

*Language Arts*

The California Department of Education adopted its *English Lungnage Arts Content Standards for California Public Schools, Kindergarten through Grade Twelve in* November 1997. These language arts standards include and often combine skills necessary to effective reading, writing, listening, and speaking. Setting standards in the same general areas, the *Texas Essential Knowledge and Skills for English Language Arts and Reading* were implemented in September 1998.

These content standards identify "the skills, knowledge, and abilities that all students should be able to master in language arts at specific grade levels during 13 years in the California public school system" (California Department of Education, 1998, p. 3). Texas similarly outlines those "essential knowledge and skills." Both Texas and California describe the content and skills that students must master by the end of each grade in the elementary years.[3] The *Reading/Language Arts Framework: for California Public Schools* elaborates.on the content standards and "describes the curriculum and instruction necessary to help students achieve the levels of mastery" (California Department of Education, 1999, p. ix).

Both California and Texas separate their reading/language arts standards into three broad areas: reading, writing, and listening and speaking[4] These broad categories are then broken down into a number of subcategories and then skills. These skills are covered in instructional and program approaches that recognize "the importance of phonemic awareness, explicit letter-sound instruction, and word recognition practice, as well as, focused comprehension instruction and significant experience with literature" (Commissioner's Group on Reading, 1996). Both Texas and California cover these same general skills in their standards.

The following sections summarize, primarily in tables, the reading/english language arts standards in California and Texas for the first, second, and third grades. The tables are modeled on the Texas standards. A bullet (•) indicates that the content standard and/or objective is explicitly stated in the respective state standards. Where the corresponding California standard is

worded in a significantly different way or adds something not included in the Texas standard, it is included in brackets. There are several California standards that are not in the Texas standards and vice versa. A listed standard that is not explicitly stated in a particular state's standards is identified by a blank box in the appropriate column.

### *First Grade*

By the end of first grade, students should be independent readers and writers with the ability to decode and recognize increasingly complex words. They should be able to connect their experiences with those in print, engaging in a variety of texts. Concurrently, they should be able to express those ideas and experiences fluently in both spoken and written language. They should be able to tell and write complete stories or reports, applying basic punctuation conventions and sentence structure.

## Table 4. Listening and Speaking (First Grade)

| *Content Standards and Objectives* | *CA* | *TX* |
|---|---|---|
| Students listen attentively and engage actively in a variety of oral language experiences. | • | • |
| Determine the purpose(s) for listening such as to get information, to solve problems, and to enjoy and appreciate. | • | • |
| Respond appropriately and courteously to directions and questions. | | • |
| [Give, restate, and follow simple two-step directions.] | • | • |
| Participate [recite] in rhymes, songs, conversations, and discussions. | • | • |
| Listen critically to interpret and evaluate ["to interpret and evaluate" not specified in CA standards]. | • | • |
| Listen responsively to stories and other texts read aloud, including selections from classic and contemporary works. | | • |
| Identify the musical elements of literary language such as it rhymes or repeated sounds. | | • |
| Students listen and speak to gain knowledge of their own culture, the culture of others, and the common elements of cultures. | | • |
| Connect experiences and ideas with those of others through speaking and listening. | | • |
| Compare language and oral traditions (family stories) that reflect customs, regions, and cultures. | | - |
| Students speak appropriately to different audiences for different purposes and occasions. | • | • |
| Choose and adapt spoken language appropriate to the audience, purpose, and occasion, including use of appropriate volume and rate [phrasing and pitch]. | • | - |
| Use verbal and nonverbal communication in effective ways such as in making announcements, giving directions, or making introductions. | | • |
| Ask and answer relevant questions and make contributions in small or large group discussions. | • | ■ |
| Present dramatic interpretations of experiences, stories, poems, or plays. [Deliver brief recitations and oral presentations about familiar experiences or interests.] | • | • |
| Gain increasing control of grammar when speaking such as using subject-verb agreement, complete sentences, and correct tense. [Demonstrate a command of standard American English.] | • | - |

| *Contents Standards and Objectives* | *CA* | *TX* |
|---|---|---|
| **Students communicate clearly by putting thoughts and feelings into spoken words.** | • | |
| Learn the vocabulary of school such as numbers, shapes, colors, directions, and categories. | | |
| Use vocabulary to describe clearly ideas, feelings, and experiences [people, places, things, and events]. | • | |
| Clarify and support spoken messages using appropriate props such as objects, pictures, and charts. | | |
| Retell a spoken message by summarizing or clarifying. | | |
| [Stay on the topic when speaking.] | • | |
| [Retell stories using basic story grammar and relating the sequence of story events by answering who, what, when, where, and how questions.] | • | |
| [Provide descriptions with careful attention to sensory detail.] | • | |

## Table 5. Reading (First Grade)

| Content Standards and Objectives | CA | TX |
|---|---|---|
| **Students demonstrate knowledge of concepts of print.** | • | • |
| Recognize that print represents spoken language and conveys meaning such as the student's own name, and signs such as Exit and Danger. [Match oral words to printed words.] | • | • |
| Know that print moves left-to-right across the page and top-to-bottom. | | • |
| Understand that written words are separated by spaces. | | • |
| Know the difference between individual letters and printed words. [Identify, letters, words, and sentences.] | • | • |
| Know the order of the alphabet. | | • |
| Know the difference between capital and lower-case letters. | | • |
| Recognize how readers use capitalization and punctuation to comprehend. | • | • |
| Understand that spoken words are represented in written language by specific sequences of letters. | | • |
| Recognize that different parts of a book such as cover, title page, and table of contents offer information. | | • |
| [Identify the title and author of a reading selection.] | • | |
| Recognize that there are correct spellings for words. | | • |
| Recognize the distinguishing features of a paragraph. | | • |
| Students orally demonstrate phonological awareness (an understanding that spoken language is composed of sequences of sounds). | • | • |
| Demonstrate the concept of words by dividing spoken sentences into individual words. | | ■ |
| Identify, segment, and combine syllables within spoken words such as by clapping syllables and moving manipulatives to represent syllables in words. | | • |
| Produce rhyming words and distinguish rhyming words from non-rhyming words. [Create and state a series of rhyming words, including consonant blends.] | - | - |
| Identify and isolate the initial and final sound of a spoken word. | | • |
| Blend sounds to make spoken words, including three- and four-phoneme words, through ways such as moving manipulatives to blend phonemes in a spoken word. | • | ■ |

| *Content Standards and Objectives* | *CA* | *TX* |
|---|---|---|
| Segment one-syllable spoken words into individual phonemes, including three and four-phoneme words, clearly producing beginning, medial, and final sounds. | • | • |
| [Distinguish long- and short-vowel sounds and orally state single-syllable words, e.g., bit/bite.] | ■ | |
| [Add, delete, or change target sounds to change words, e.g., change cow to how] | ■ | |
| The student uses letter-sound knowledge to decode written language. | ■ | |
| Name and identify each letter of the alphabet. | | • |
| Understand that written words are composed of letters that represent sounds. | | ■ |
| Learn and apply letter-sound correspondences of a set of consonants and vowels to begin to read. | | ■ |
| Learn and apply the most common letter-sound correspondences, including the sounds represented by single letters (consonants and vowels); consonant blends such as bl, st, tr; consonant digraph such as th, sh, ck; and vowel digraph and diphthongs such as ea, ie, ee. [Generate the sounds from all the letters and letter patterns, including consonant blends and long- and short-vowel patterns (phonograms) and blend those sounds into recognizable words.] [Use knowledge of vowel digraph and r-controlled, letter-sound associations to read words.] | • | • |
| Blend initial letter sounds with common vowel-spelling patterns to read words. [*] | | ■ |
| Decode by using all letter-sound correspondences within regularly spelled words. [*] | | • |
| Use letter-sound knowledge to read decodable texts (engaging and coherent texts in which most of the words are comprised of an accumulating sequence of letter-sound correspondences being taught). [*] | | ■ |
| [Select letter patterns and know how to translate them into spoken language by using phonics, syllabication, and word parts. Note: this objective may include within its scope several of the objectives above and below, marked with. [*] | • | |
| The student uses a variety of word identification strategies. | • | • |
| Decode by using all letter-sound correspondences within a word. [*] | • | • |
| Use common spelling patterns to read words. [*] | • | • |

| *Content Standards and Objectives* | *CA* | *TX* |
|---|---|---|
| Use structural cues to recognize words such as compounds, base words, and inflections such as -s, -es, -ed, and -ing. [Read compound words and contractions.] [Read inflectional forms.] | • | • |
| Identify multisyllabic words by using common syllable patterns. [*] | • | • |
| Recognize high-frequency irregular words such as said, was, where, is, the, of. | • | • |
| Use knowledge of word order (syntax) and context to support word identification and confirm word meaning. [Use context to resolve ambiguities about word and sentence meanings.] | a | • |
| Read both regular and irregular words automatically such as through multiple opportunities to read and reread. | | a |
| [Read common word families (e.g., -ite, -ate).] | a | |
| The student reads with fluency and understand texts at appropriate difficulty levels. | • | a |
| Read regularly in independent-level materials (texts in which no more than approximately 1 in 20 words is difficult for the reader). | | • |
| Read regularly in instructional-level materials that are challenging but manageable (texts in which no more than approximately 1 in 10 words is difficult for the reader; a "typical" first grader reads approximately 60 wpm). | | • |
| [Note: in relation to the two standards above, CA supplies *Recommended Readings* in *Literature, Kindergarten through* Grade *Eight* which "illustrate the quality and complexity of the materials to be read by students."] | | |
| Read orally from familiar texts with fluency (accuracy, expression, appropriate phrasing, and attention to punctuation). | • | • |
| Self-select independent level reading such as by drawing on personal interest, by relying on knowledge of authors and different types of texts, and/or by estimating text difficulty. | | • |
| Students read widely for different purposes in varied sources. | • | • |
| Read fiction, nonfiction, and poetry, including classic and contemporary works, for pleasure and/or information. | • | • |
| Use graphs, charts, signs, captions, and other informational texts to acquire information | | • |
| Students develop an extensive vocabulary. | • | • |
| Discuss meanings of words and develop vocabulary through meaningful/concrete experiences. | | • |

| *Content Standards and Objective* | *CA* | *TX* |
|---|---|---|
| Develop vocabulary by listening to and discussing both familiar and conceptually challenging selections read aloud. | | • |
| Identify words that name persons, places, or things and words that name actions. | | • |
| [Classify grade-appropriate categories of words (e.g., concrete collections of animals, food, toys).] | • | |
| Students use a variety of strategies to comprehend selections read aloud and selections read independently. | • | • |
| Use prior knowledge to anticipate meaning and make sense of texts. | • | • |
| Establish purposes for reading and listening such as to be informed, follow directions, and to be entertained. | | • |
| Retell or act out the order of important events in stories. [Retell the central ideas of simple expository or narrative passages.] | • | • |
| Monitor their comprehension and act purposefully when comprehension breaks down using strategies such as rereading, searching for clues, and asking for help. | | • |
| Draw and discuss visual images based on text descriptions. | | • |
| Make and explain inferences from texts such as determining important ideas and causes and effects, making predictions, and drawing conclusions. [Draw upon a variety of comprehension strategies as needed such as generating and responding to essential questions, making predictions, comparing information from several sources.] [Confirm predictions about what will happen next in a text by identifying key words.] | • | • |
| Identify similarities and differences across texts such as in topics, characters, and problems. | | • |
| Students respond to various texts. | | • |
| Listen to stories being read aloud. | | • |
| Participate actively (react, speculate, join in, read along) when predictable and patterned selections are read aloud. | | • |
| Respond through talk, movement, music, art, drama, and writing to a variety of stories and poems in ways that reflect understanding and interpretation. | | • |
| Connect ideas and themes across texts. | | a |
| Describe how illustrations contribute to the text. | | • |
| [Follow one-step written instructions.] | • | |

| *Content Standards and Objectives* | *CA* | *TX* |
|---|---|---|
| **Students recognize characteristics of various types of texts.** | • | • |
| Distinguish different forms of texts such as lists, newsletters, and signs and the functions they serve. | | • |
| Understand simple story structure. [Recognize the story's beginning, middle, and ending.] | • | • |
| Distinguish fiction from nonfiction, including fact and fantasy | | • |
| Recognize the distinguishing feamres of familiar genres, including stories, poems, and informational texts. | | • |
| Understand literary forms by recognizing and distinguishing among such types of text as stories, poems, and information books. | | • |
| Understand literary terms by distinguishing between the roles of the author and illustrator such as the author writes the story and the illustrator draws the pictures. | • | • |
| Analyze characters, including their traits, feelings, relationships, and changes. [Identify and describe the characters in a story.] | • | • |
| Identify the importance of the setting to a story's meaning. [Identify and describe the setting in a story.] | • | • |
| Recognize the story problem(s) or plot. [Identify and describe the plot in a story.] | • | • |
| [Identify text that uses sequence or other logical order.] | • | |
| **Students generate questions and conduct research about topics using information from a variety of sources including selections read aloud.** | • | • |
| Identify relevant questions for inquiry such as "What do pill bugs eat?" [Respond to who, what, when, where, and how questions.] | • | |
| Use pictures, print, and people to gather information and answer questions. | | • |
| Draw conclusions from information gathered. | | • |
| Use alphabetical order to locate information. | | • |
| Recognize and use parts of a book to locate information, including table of contents, chapter titles, guidewords, and indices. | | • |
| Locate important areas of the library/media center. | | • |
| [Recollect, talk, and write about books read during the school year.] | • | |

| *Content Standards and Objectives* | *CA* | *TX* |
|---|---|---|
| **Students read or listen to increase knowledge of their own culture, the culture of others, and the common elements of cultures.** | • | • |
| **Connect their own experiences with the life experiences, languages, customs, and culture of others.** | | • |
| **Compare experiences of characters across cultures.** | | • |

## Table 6. Writing (First Grade)

| *Content Standards and Objectives* | *CA* | *TX* |
|---|---|---|
| **Students develop the foundations of writing.** | • | • |
| Write their own name and other important words. | | • |
| Write each letter of the alphabet, both capital and lowercase, using correct formation, appropriate size, and spacing. | | • |
| Use phonological knowledge to map sounds to letters to write messages. | | • |
| Write messages that move left-to-right and top-to-bottom on the page. | | • |
| Gain an increasing control of penmanship such as pencil grip, paper position, stroke, and posture. | | • |
| Use word and letter-spacing and margins to make messages readable. [Print legibly and space letters, words, and sentences appropriately.] | • | • |
| Use basic capitalization and punctuation such as capitalizing names and first letters in sentences [and the pronoun I, using periods, question marks, and exclamation points. | • | • |
| [Write and speak in complete, coherent sentences.] | • | |
| [Distinguish between declarative, exclamatory, and interrogative sentences.] | • | |
| **Students write for a variety of audiences and purposes and in a variety of forms.** | • | • |
| Dictate messages such as news and stories for others to write. | | • |
| Write labels, notes, and captions for illustrations, possessions, charts, and centers. | | • |
| Write to record ideas and reflections. | | • |
| Write to discover, develop, and refine ideas. | | • |
| Write to communicate with a variety of audiences. | | • |
| Write in different forms for different purposes such as lists to record, letters to invite or thank, and stories or poems to entertain. | | • |
| [Write compositions that describe and explain familiar objects, events, or experiences.] | • | |
| [Use descriptive words when writing] | • | |
| [Write brief narratives (e.g., fictional, autobiographical) describing an experience.] | • | |

| *Content Standards and Objectives* | *CA* | *TX* |
|---|---|---|
| [Write brief expository descriptions of a real object, person, place, or event using sensory details.] | • | |
| **Students select and use writing processes to compose original text.** | • | • |
| Generate ideas before writing on self-selected topics. [Engage in prewriting.] | • | • |
| Generate ideas before writing on assigned tasks. [Engage in prewriting.] | • | • |
| Develop drafts. | • | • |
| Revise selected drafts for varied purposes, including to achieve a sense of audience, precise word choices, and vivid images. | • | • |
| Use available technology to compose text. | | • |
| [Select a focus when writing.] | • | |
| Students spell proficiently. | • | |
| Write with more proficient spelling of regularly spelled patterns such as consonant-vowel-consonant (hop), consonant-vowel-consonant silent e (hope), and one-syllable words with blends (drop). | | • |
| Write with more proficient spelling of inflectional endings such as plurals and verb tenses. [Identify and correctly use singular and plural nouns.] | • | • |
| Spell single syllable words that have r-controlled vowels such as in bum or star; that have the final consonants f, 1, and s such as in miss or doll; and that have ck as the final consonants such as in buck. | | • |
| Use resources to find correct spellings, synonyms, and replacement words. | | • |
| Use conventional spelling of familiar words in final drafts. | | • |
| [Identify and correctly use contractions (e.g., isn't, aren't, can't, won't) and singular possessive pronouns (e.g., my/mine, his/hers, your/s).] | • | |
| [Spell three- and four-letter short-vowel words and grade-level-appropriate sight words correctly.] | • | |
| **Students compose meaningful texts by applying knowledge of** grammar and usage. | • | • |
| Use nouns and verbs in sentences. | | • |
| Compose complete sentences in written texts and use the appropriate end punctuation. | • | • |

| *Content Standards and Objectives* | *CA* | *TX* |
|---|---|---|
| Students evaluate their own writing and the writing of others. ["Others" not specified in CA.] | ■ | • |
| Identify rhe mosr effecrive features of a piece of writing using criteria generared by rhe reacher and class. | | • |
| Respond constructively to others' writing. | | • |
| Derermine how their own writing achieves its purposes. | | • |
| Students use writing as a tool for learning and research. | | • |
| Record or dicrare quesrions for investigaring. | | • |
| Record or dicrare their own knowledge of a topic in various ways such as by drawing pictures, making lists, and showing connections among ideas. | | • |

As we can see, there is significant overlap in the two states' standards in the language arts, including listening and speaking, reading, and writing. Of the 23 language arts content standards only six are not explicitly shared by both states. Two of these six content standards are, however, represented by related objectives.

*Second Gmde*

By the end of second grade, students should have skills in editing and revising their own and others' text. They should have an extended repertoire of reading comprehension strategies that enable them to read and grasp larger and more complex units of text, especially text from which they must acquire new information (e.g., narrative and expository text). They should be able to summarize such text and begin to develop more sophisticated analytical techniques (e.g., comparison and contrast). Students should have legible penmanship, forming all letters correctly and properly spacing words.

**Table 7. Listening/Speaking (Second Grade)**

| *Content Standards and Objectives* | *CA* | *TX* |
|---|---|---|
| The student listens attentively and engages actively in a variety of oral language experiences. | • | • |
| Determine the purpose(s) for listening such as to get information, to solve problems, and to enjoy and appreciate. | • | • |
| Respond appropriately and courteously to directions and questions. | | • |
| [Give and follow three- and four-step oral directions.] | • | |
| Participate in rhymes, songs, conversations, and discussions. | | • |
| Listen critically to interpret and evaluate. | • | • |
| Listen responsively to stories and other texts read aloud, including selections from classic and contemporary works. | | • |
| Identify the musical elements of literary language such as its rhymes, repeated sounds, or instances of onomatopoeia. | | • |
| The student listens and speaks to gain knowledge of his/her own culture, the culture of others, and the common elements of cultures. | | • |
| Connect experiences and ideas with those of others through speaking and listening. | | • |
| Compare language and oral traditions (family stories) that reflect customs, regions, and cultures. | | • |
| The student speaks appropriately to different audiences for different purposes and occasions. | • | • |
| Choose and adapt spoken language appropriate to the audience, purpose, and occasion, including use of appropriate volume and rate [phrasing, pitch and modulation]. | • | • |
| Use verbal and nonverbal communication in effective ways such as making announcements, giving directions, or making introductions. [Note: only giving directions is specified in CA.] | • | • |
| Ask and answer relevant questions and make contributions in small or large group discussions. | | • |
| Present dramatic interpretations of experiences, stories, poems, or plays. | | • |
| Gain increasing control of grammar when speaking such as using subject-verb agreement, complete sentences, and correct tense. [Note: only "distinguish between complete and incomplete sentences" is explicit in the CA standards.] | | • |

| *Content Standards and Objectives* | *CA* | *TX* |
|---|---|---|
| The student communicates clearly by putting thoughts and feelings into spoken words. | • | • |
| Use vocabulary to describe clearly ideas, feelings, and experiences. [Recount experiences in a logical sequence and retell stories, including characters, setting, and plot.] | • | • |
| Clarify and support spoken messages using appropriate props such as objects, pictures, or charts. | | • |
| Retell a spoken message by summarizing or clarifying. [Paraphrase information that has been shared orally by others.] | • | • |
| [Report on a topic with supponive facts and details.] | • | |

## Table 8. Reading (Second Grade)

| *Content Standards and Objectives* | *CA* | *TX* |
|---|---|---|
| The student uses a **variety** of word **identification** strategies. | • | • |
| Decode by using all letter-sound correspondences within a word. | • | • |
| Blend initial **lettersounds** with common vowel spelling patterns to read words. | | • |
| Recognize high-frequency irregular words such as said, was, where, and is. [Note: this is listed under "writing" in CA.] | • | • |
| **Identify** multisyllabic words by using common syllable patterns. [Decode two-syllable nonsense words and regular multisyllabic words.] | • | • |
| Use structural cues to recognize words such as compounds, base words, and inflections such as **-s, -es, -ed,** and **-ing.** [Use knowledge of individual words in unknown compound words to predict their meaning.] | • | • |
| [Recognize common abbreviations (e.g., Jan., Sun., Mr., St.).] | • | |
| Use structural cues such as prefixes and suffiies to recognize words, for example, un- and **-ly.** | • | • |
| Use knowledge of word order (syntax) and context to **support** word identification and confirm word meaning. | | • |
| Read both regular and **irregular** words automaticallysuch as through multiple opportunities to read and reread. | | • |
| [Identify simple multiple-meaning words.] | • | |
| The student reads **with** fluency and understanding in **texts** at appropriate **difficulty** levels. | • | • |
| Read regularly in independent-level materials (texts in which no more than approximately 1 in 20 words is difficult for the reader). | | • |
| Read regularly in instructional-level materials that are challenging but manageable (texts in which no more than approximately 1 in 10 words is **difficult** for the reader, a "typical" second grader reads approximately 70 wpm). | | • |
| [Note: instead of an explicit standard similar to the m o above CA provides selections of their *Recommended Readings* in *Literature, Kindergarten through Grade Eight* to "illustrate the quality and complexity of the materials to be read by students."] | | |
| Read **orally from** familiar texts with fluency (accuracy, expression, appropriate phrasing, and attention to punctuation). [Read aloud fluently and accumtely and with appropriate intonation and expression.] | • | • |

| *Content Standards and Objectives* | *CA* | *TX* |
|---|---|---|
| Self-select independent-level reading by drawing on personal interests, by relying on knowledge of authors and different types of texts, and/or by estimating text difficulty | | • |
| Read silently for increasing periods of time. [Note: "increasing periods of time" not specified in t k CA standards.] | • | • |
| The student reads widely for different purposes in varied sources. | • | • |
| Read classic and contemporary works. | • | • |
| Read from a variety of genres for pleasure and to acquire information from both print and electronic sources. | • | • |
| Read to accomplish various purposes, both assigned and self-selected. | • | • |
| The student develops an extensive vocabulary. | • | • |
| Discuss meanings of words and develop vocabulary through meaningful/concrete experiences. | | • |
| Develop vocabulary by listening to and discussing both familiar and conceptually challenging selections read aloud. | • | • |
| Develop vocabulary through reading | • | • |
| Use resources and references such as beginners' dictionaries, glossaries, available technology, and context to build word meanings and to confirm pronunciation of words. [Understand the purposes of various reference materials (e.g., dictionary, thesaurus, atlas).] | • | • |
| [Understand and explain common antonyms and synonyms] | • | |
| The student uses a variety of strategies to comprehend selections read aloud and selections read independently. | • | • |
| Use prior knowledge to anticipate meaning and make sense of texts [Note: only "use knowledge of the author's purpose(s) to comprehend informational text" is specified in CA.] | | • |
| Establish purposes for reading and listening such as to be informed, to follow directions, and to be entertained. [Tell what information is sought.] | • | • |
| Retell or act out the order of important events in stories. [Restate facts and details in the text to clarify and organize ideas.] | • | • |
| Monitor his/her own comprehension and act purposefully when comprehension breaks down such as rereading, searching for clues, and asking for help. [Ask for clarification and explanation of stories and ideas.] [Ask clarifying questions about essential textual elements of exposition (e.g., why, what if, how).] | • | • |

| *Content Standards and Objectives* | *CA* | *TX* |
|---|---|---|
| Draw and discuss visual images based on text descriptions. | | • |
| Make and explain inferences from texts such as determining important ideas and causes and effects, making predictions, and drawing conclusions. | • | • |
| Identify similarities and differences across texts such as in topics, characters, and problems. [Compare and contrast plots, settings, and characters presented by different authors.] | • | • |
| Produce summaries of text selections. | | • |
| Represent text information in different ways, including story maps, graphs, and charts. [Interpret information from diagrams, charts, and graphs.] | | • |
| The student responds to various **texts.** | • | a |
| Respond to stories and poems in **ways** that reflect understanding and interpretation in discussion (speculating, questioning), in writing, and through movement, music, art, and drama [Note: only "ask clarifying questions about essential elements" specified in **CA.]** | • | • |
| Demonstrate understanding of informational text in various ways such as through writing, illustrating, developing demonstrations, and using available technology. | | • |
| Support interpretations or conclusions with examples drawn from text. | | • |
| Connect ideas and themes across texts. | | • |
| The student analyzes the characteristics of various types of **texts.** | • | • |
| Distinguish different forms of texts, including lists, newsletters, and signs and the functions they serve. | | • |
| Identify text as written for entertainment (nanative) or for information (expository). | • | • |
| Distinguish fiction from nonfiction, including fact and fantasy. | | • |
| Recognize the distinguishing features of familiar genres, including stories, poems, and informational texts. | | • |
| Compare communication in different forms such as contrasting a dramatic performance with a print version of the same story or comparing story variants. | | • |
| Understand and identify simple literary terms such as title, author, and illustrator across a variety of literary forms (texts). | | • |
| Understand literary forms by recognizing and distinguishing among such types of text as stories, poetry, and information books. | | • |

| *Content Standards and Objectives* | *CA* | *TX* |
|---|---|---|
| Analyze characters, including their traits, relationships, and changes. | • | • |
| Identify the importance of the setting to a story's meaning | • | • |
| Recognize the story problem(s) or plot. | • | • |
| [Note: the last three standards above are reflected in the CA standard requiring students to compare and contrast these textual elements as presented by different authors.] | | |
| The student generates questions and conducts research, using information from various sources. [Understand the purpose of various reference materials.] | • | • |
| Identify relevant questions for inquiry such as "Why do birds build different kinds of nests?" | | • |
| Use alphabetical order to locate information. | | • |
| Recognize and use parts of a book to locate information, including table of contents, chapter titles, guide words, and indices. | • | • |
| Use multiple sources, including print (such as an encyclopedia), technology, and experts to locate information that addresses questions. [Understand the purpose of various reference materials.] | • | • |
| Interpret and use graphic sources of information such as maps, charts, graphs, and diagrams. | • | • |
| Locate and use important areas of the library media center. | | |
| Demonstrate learning through productions and displays such as murals, written and oral reports, and dramatizations.[Note: murals and dramatizations not specified in CA.] | • | • |
| Draw conclusions from information gathered. | | • |
| [Generate alternative endings to plots and identify the reason or reasons for, and the impact of, the alternatives] | • | |
| The student reads to increase knowledge of his/her own culture, the culture of others, and the common elements of culture. | • | • |
| Connect life experiences with the life experiences, language, customs, and culture of others. | | • |
| Compare experiences of characters across cultures. [Compare and contrast different versions of the same stories that reflect different cultures.] | • | ■ |

## Table 9. Writing (Second Grade)

| *Content Standards and Objectives* | *CA* | *TX* |
|---|---|---|
| **The student writes for a variety of audiences and purposes and in various forms.** | • | • |
| Write to record ideas and reflections. | | • |
| Write to discover, develop, and refine ideas. | | • |
| Write to communicate with a variety of audiences. | • | • |
| Write in different forms for different purposes such as lists to record, letters to invite or thank [friendly letter complete with date, salutation, body, closing, and signature], and stories or poems to entertain. [Note: lists and poems not specified in CA standards.] | • | • |
| [Write brief narratives based on their experiences and compositions that describe and explain familiar objects and events.] | • | |
| **The student composes original texts using the conventions of written language such as capitalization and handwriting to communicate clearly.** | • | • |
| Gain increasing control of aspects of penmanship such as pencil grip, paper position, stroke, posture, and using correct letter formation, appropriate size, and spacing | | • |
| Use word and letter spacing and margins to make messages readable. | | - |
| [Note: the two objectives above fall under the more generic objective of "create readable documents with legible handwriting in CA.] | | |
| Use basic capitalization and punctuation correctly, such as capitalizing names and first letters in sentences, using periods, question marks, and exclamation points. [Note: sentence end marks not specified in CA standards.] | • | ■ |
| Use more complex capitalization and punctuation with increasing accuracy such as proper nouns, abbreviations, commas, apostrophes, and quotation marks. | • | • |
| [Recognize and use the correct word order in written sentences.] | - | |
| [Identify and correctly use various parts of speech, including nouns and verbs in writing and speaking.] | • | |
| **The student spells proficiently.** | - | - |
| Use resources to find correct spellings, synonyms, and replacement words. [Understand the purpose of various reference materials.] | • | • |

| *Content Standards and Objectives* | *CA* | *TX* |
|---|---|---|
| Write with more proficient use of orthographic patterns and rules such as keep/cap, sack/book, out/cow, consonant doubling, dropping e, and changing y to i. [Recognize and use knowledge of spelling patterns (e.g., diphthongs, special vowel spellings) when reading] [Apply knowledge of basic syllabication rules when reading (e.g., vowel-consonant-vowel= su/per, vowel-consonant/consonant-vowel = sup/per).] [Identify and correctly use regular plurals (e.g., -s, -es, -ies) and irregular plurals (e.g., fly/flies, wife/wives).] | • | • |
| The student composes meaningful **texts** applying knowledge. | • | • |
| Use singular and plural forms of regular nouns. | • | • |
| Compose complete sentences in written texts and use the appropriate end punctuation. | • | • |
| Compose sentences with interesting, elaborated subjects. | | • |
| [Write clear and coherent sentences and paragraphs that develop a central idea.] | • | |
| Edit writing toward standard grammar and usage, including subject-verb agreement; pronoun agreement, including pronouns that agree in number; and appropriate verb tenses, including to be, in final drafts. [Identify and correctly use various parts of speech, including nouns and verbs, in writing and speaking.] [Note: Although not as specific as this objective, CA, as TX, follows the writing process which has "editing" as a feature.] | • | • |
| **The student selects and uses writing processes for self-initiated** and assigned writing. | • | |
| Generate ideas for writing by using prewriting techniques such as drawing and listing key thoughts. | • | • |
| [Group related ideas and maintain a consistent focus.] | • | |
| Develop drafts. | • | • |
| Revise selected drafts for varied purposes, including to achieve a sense of audience, precise word choices, and vivid images. | • | • |
| Edit for appropriate grammar, spelling, punctuation, and features of polished writings. | • | • |
| Use available technology for aspects of writing, including word processing, spell checking, and printing. | | • |
| Demonstrate understanding of language use and spelling by bringing selected pieces frequently to final form and "publishing" them for audiences. [Note: "publishing" not specified in CA but is a typical feature of the writing process which CA espouses.] | • | • |

| *Content Standards and Objectives* | *CA* | *TX* |
|---|---|---|
| The student evaluates his/her own writing and the writing of others. [Note: "others" not explicit in CA.] | • | • |
| Identify the most effective features of a piece of writing using criteria generated by the teacher and class. [Note: the CA standards emphasize comparison and contrast of elements of text.] | | • |
| Respond constructively to others' writing. | | • |
| Determine how his/her own writing achieves its purposes. | | • |
| Use published pieces as models for writing. | | • |
| Review a collection of his/her own written work to monitor growth as a writer. | | • |
| The student uses **writing** as a tool for learning and research. | | • |
| Write or dictate knowledge of a topic in various ways such as by drawing pictures, making lists, and showing connections among ideas. | | • |
| Record his/her own knowledge of a topic in various ways such as drawing pictures, making lists, and showing connections among ideas. | | • |
| Take simple notes from relevant sources such as classroom guests, information books, and media sources. | | • |
| Compile notes into outlines, reports, summaries, or other written efforts using available technology. | | • |

As was the case in the &st-grade standard, there is significant overlap in the two states' standards in the second-grade language arts. Of the 20 language arts content standards only three are not explicitly shared by both states. One of these three content standards is, however, represented by related objectives.

*Third Grade*

By the end of third grade, students should be able to recognize new words by considering root words, affixes, and derivational endings. In both speaking and writing, students should be able to support their ideas and inferences by citing portions of text and using background knowledge. Writing should involve the use of longer and more elaborate sentences and the formation of paragraphs and larger units of text Text should include proper use of more complex capitalization and punctuation (e.g., proper nouns and commas in a series). In reading, students should be able to distinguish fact from opinion, make predictions, summarize, and answer questions that require analysis, synthesis, and evaluation of expository text.

## Table 10. Listening/Speaking (Third Grade)

| *Content Standards and Objectives* | *CA* | *TX* |
|---|---|---|
| The student listens attentively and engages actively in a variety of oral language experiences. [Students listen critically and respond appropriately to oral communication.] | • | • |
| Determine the purpose(s) for listening such as to get information, to solve problems, and to enjoy and appreciate. | | • |
| Respond appropriately and courteously [with appropriate elaboration] to directions and questions. | • | • |
| Participate in rhymes, songs, conversations, and discussions. | | • |
| Listen critically to interpret and evaluate. [Note: CA objectives are much less general in this area and specify that students "compare ideas and points of view expressed in broadcast and print media" and "distinguish between the speaker's opinions and verifiable facts."] | • | • |
| Listen responsively to stories and other texts read aloud, including selections from classic and contemporary works. | | • |
| Identify the musical elements of literary language such as its rhymes, repeated sounds or instances of onomatopoeia [and alliteration]. [Note: this objective is also listed under "reading" in CA.] | • | • |
| The student listens and speaks to gain knowledge of his/her own culture, the culture of others, and the common elements of cultures. | | • |
| Connect experiences and ideas with those of others through speaking and listening. [Note: this is not explicitly connected to "culture" in CA.] | • | • |
| Compare language and oral traditions (family stories) that reflect customs, regions, and cultures. | | • |
| The student speaks appropriately to different audiences for different purposes and occasions. | • | • |
| Choose and adapt spoken language appropriate to the audience, purpose, and occasion, including use of appropriate volume and rate. | | • |
| Use verbal and nonverbal communication in effective ways such as making announcements, giving directions, or making introductions. | | • |
| Ask and answer relevant questions and make contributions in small or large group discussions. | | • |
| Present dramatic interpretations of experiences, stories, poems or plays [with clear diction, pitch, tempo, and tone]. | • | • |
| [Read prose and poetry aloud with fluency, rhythm, and pace, using appropriate intonation and vocal patterns to emphasize important passages of the text being read.] | • | |

| *Content Standards and Objectives* | *CA* | *TX* |
|---|---|---|
| [Make brief narrative presentations that provide a context, details of character, setting, plot, and insight into why the incident is memorable.] | • | |
| [Make descriptive presentations that use concrete sensory details to set forth and support unified impressions of people, places, things, or experiences.] | • | |
| Gain increasing control of grammar when speaking such as using subject-verb agreement, complete sentences, and correct tense. [Note: CA is more specific here, specifying the three objectives that follow] | • | • |
| [Identify subjects and verbs that are in agreement, and identify and use pronouns, adjectives, compound words, and articles correctly in writing and speaking] | • | |
| [Identify and use past, present, and future verb tenses properly in writing and speaking] | ■ | |
| [Identify and use subjects and verbs correctly in speaking and writing simple sentences.] | ■ | |
| **The student communicates clearly by putting thoughts and** feelings **into** spoken words. | • | • |
| Use vocabulary to describe clearly ideas, feelings, and experiences. [Use clear and specific vocabulary to communicate ideas and establish the tone.] | • | • |
| Clarify and support spoken messages using appropriate props such as objects, pictures, or charts. | • | • |
| Retell a spoken message by summarizing or clarifying [and paraphrasing and explaining.] | • | • |
| [Organize ideas chronologically or around major points of information.] | • | |
| [Provide a beginning, a middle, and an end, including concrete details that develop a central idea.] | • | |
| The student uses a variety of word identification strategies. | • | • |
| Decode by using all letter-sound correspondences within a word [phonics]. | • | • |
| Blend initial letter-sounds with common vowel-spelling patterns to read words. | • | • |
| Identify multisyllabic words by using common syllable pattems [Decode regular multisyllabic words]. | • | • |

| *Content Standards and Objectives* | *CA* | *TX* |
|---|---|---|
| Use mot words and other structural cues such as prefures, suffixes, and derivational endings to recognize words. | • | • |
| Use knowledge of word order (syntax) and context to support word identification and confirm word meaning | | • |
| Read both regular and irregular words automatically such as through multiple opportunities to read and reread. [Know and use complex word families when reading, e.g., -ight, to decode unfamiliar words.] | • | • |

## Table 11. Reading (Third grade)

| *Content Standards and Objectives* | *CA* | *TX* |
|---|---|---|
| ***The*** student reads with fluency and understanding in texts at appropriate **difficulty** levels. | • | • |
| Read regularly in independent-level materials (texts in which no more than approximately 1 in 20 words is difficult for the reader). | | • |
| Read regularly in instructional-level materials that are challenging but manageable (texts in which no more than approximately 1 in 10 words is difficult for the reader, the "typical" third grader reads 80 wpm). | | • |
| [Note: instead of an explicit standard similar to the two above, CA provides selections of their *Recommended* **Readings** in *Literature, Kindergarten* through Grade *Eight* to "illustrate the quality and **complexity** of the materials to be read by students."] | | |
| Read orally from familiar texts [narrative and expository] with fluency (accuracy, expression, appropriate phrasing [and pacing and intonation], and attention to punctuation). | • | - |
| Self-select independent-level reading such as by drawing on personal interests, by relying on knowledge of authors and different types of texts, and/or by estimating text difficulty. | | • |
| Read silently for increasing periods of time. [Note: silent reading is explicit in the CA objectives but not "increasing periods of time."] | • | • |
| The student reads widely for **different** purposes in **varied** sources. | • | • |
| Read classic and contemporary works. | • | • |
| Read from a variety of genres for pleasure and to acquire information from both print and electronic sources. | • | • |
| Read to accomplish various **purposes,** both assigned and self-selected. | | • |
| The student develops an extensive **vocabulary.** | • | • |
| Develop vocabulary by listening to and discussing both familiar and conceptually challenging selections read aloud. | • | • |
| Develop vocabulary through reading. | • | • |
| Use resources and references such as beginners' dictionaries, glossaries, available technology, and context to build word meanings and to confirm pronunciations of words. | • | • |
| Demonstrate knowledge of synonyms, antonyms, and multi-meaning words [and homophones and homographs] (by sorting, **classifying,** and **identifying** related words). [Demonstrate knowledge of levels of specificity among grade-appropriate words and explain the importance of these relations, e.g., dog/mammal/animal/living things.] | • | • |

| *Content Standards and Objectives* | *CA* | *TX* |
|---|---|---|
| The student uses a variety of strategies to comprehend selections read aloud and selections read independently. | • | • |
| Use prior knowledge to anticipate meaning and make sense of texts. | • | • |
| Establish purposes for reading and listening such as to be informed, to follow directions, and to be entertained. | | • |
| Retell or act out the order of important events in stories. | | • |
| Monitor his/her own comprehension and act purposefully when comprehension breaks down using such strategies as rereading, searching for clues, and asking for help. | | • |
| Draw and discuss'visual images based on text descriptions. | | • |
| Make and explain inferences from texts such as determining important ideas, causes and effects, making predictions, and drawing conclusions [Ask questions and support answers by connecting prior knowledge with literal information found in, and inferred from, the text and recall major points in the text and make and modify predictions about forthcoming information.] | • | |
| [Distinguish the main idea and supporting details in expository text.] | • | |
| Identify similarities and differences across texts such as in topics, characters, and themes. | | • |
| Produce summaries of text selections. | | • |
| Represent text information in different ways, including story maps, graphs, and charts. | | • |
| Distinguish fact from opinion in various texts, including news stories and advertisements [Note: CA includes this as an objective under "listening and speaking" when listening to speakers. It is, however, not explicit under "reading."] | | • |
| Practice different kinds of questions and tasks, including test-like comprehension questions. | | • |
| The student responds to various texts. | • | • |
| Respond to stories and poems in ways that reflect understanding and interpretation in discussion (speculating, questioning), in writing, and through movement, music, art, and drama. | | • |
| Demonstrate understanding of informational text in a variety of ways through writing, illustrating, developing demonstrations, and using available technology | | • |
| Support interpretations or conclusions with examples drawn from text. | | • |

| *Content Standards and Objectives* | *CA* | *TX* |
|---|---|---|
| Connect ideas and themes across texts. | | • |
| [Demonstrate comprehension by identifying answers in the text.] | • | |
| [Follow simple multiple-step written instructions, e.g., how to assemble something or play a game.] | • | • |
| The student analyzes the characteristics of various types of texts. | • | • |
| Distinguish different forms of text including lists, newsletters, and signs and the functions they serve. | • | • |
| Distinguish fiction from nonfiction, including fact and fantasy | • | • |
| [Determine the underlying theme or author's message in fiction and nonfiction text.] | • | |
| Recognize the distinguishing features of familiar genres, including stories, poems, and informational texts. [Distinguish between the structural features of the text and literary forms.] | • | • |
| Compare communication in different forms such as contrasting a dramatic performance with a print version of the same story or comparing story variants. | | • |
| Understand and identify literary terms such as title, author, illustrator, playwright, theater, stage, act, dialogue, and scene across a variety of literary forms. | • | • |
| Understand literary forms by recognizing and distinguishing among such types of text as stories, poems, myths, fables, tall tales, limericks, plays, biographies, and autobiographies. [Distinguish common forms of literature, e.g., poetry, drama, fiction, nonfiction] | • | • |
| Analyze characters, including their traits, feelings, relationships, and changes. [Determine what characters are like by what they say or do and by how the author or illustrator portrays them] | • | • |
| Identify the importance of the setting to a story's meaning | • | • |
| Recognize the story problem(s) or plot. | • | • |
| [Identify the speaker or narrator in a selection.] | • | |
| The student generates questions and conducts research using information from various sources. | • | • |
| Identify relevant questions for inquiry such as "What Native American tribes inhabit(ed) Texas?"[Generate and respond to essential questions.] | • | • |
| Recognize and use parts of a book to locate information, including table of contents, chapter, titles, guide words, and indices using alphabetical order to locate information | a | a |

| *Content Standards and Objectives* | *CA* | *TX* |
|---|---|---|
| Use multiple sources, including print (such as an encyclopedia), technology, and experts, to locate information that addresses questions. [Compare information from several sources.] | • | • |
| Interpret and use graphic sources of information, including maps, charts, graphs, and diagrams. | | • |
| Locate and use important areas of the library media center. | | • |
| Organize information in systematic ways, including notes, charts, and labels. | | • |
| Demonstrate learning through productions and displays such as oral and written reports, murals, and dramatizations. [Note: murals and dramatizations not specified in CA.] | • | • |
| Use compiled information and knowledge to raise additional, unanswered questions. | | • |
| Draw conclusions from information gathered. | | • |
| [Extract appropriate and significant information from the text, including problems and solutions.] | • | |
| The student reads to increase knowledge of his/her own culture, the culture of others, and the common elements of culture. | | • |
| Connect his/her own experiences with the life experiences, language, customs, and culture of others. | | • |
| Compare experiences of characters across cultures. | | • |
| [Comprehend basic plots of classic fairy tales, myths, folktales, legends, and fables from around the world.] | • | |

## Table 12. Writing (Third Grade)

| *Content Standards and Objectives* | *CA* | *TX* |
|---|---|---|
| The student writes for a variety of audiences and purposes and in various forms. | • | • |
| Write to record ideas and reflections. | | • |
| Write to discover, develop, and refine ideas. [Write compositions that describe using concrete sensory details and explain familiar objects, events, people, places, and experiences.] | • | • |
| Write to communicate with a variety of audiences. | • | • |
| Write in different forms for different purposes such as lists to record, letters to invite or thank, and stories or poems to entertain [and narratives that provide a context, include well-chosen details to develop the plot, and provide insight into why the incident is memorable.] | • | • |
| The student composes original texts using the convention of written language such as capitalization and penmanship to communicate clearly. | • | • |
| Gain more proficient control of all aspects of penmanship [Write legibly in cursive or joined italic, allowing margins and correct spacing between letters in a word and words in a sentence.] | • | • |
| Use capitalization and punctuation such as commas in a series, apostrophes in contractions (such as can't) and possessives (such as Robin's) quotation marks, proper nouns, and abbreviations with increasing accuracy. [Punctuate dates, city and state, and titles of books correctly Use commas in dates, locations, addresses, and for items in a series. Capitalize geographical names, holidays, historical periods, and special events correctly.] | • | • |
| [Include the date, proper salutation, body, closing, and signature in letters.] | • | |
| The student spells proficiently. | • | • |
| Write with more proficient spelling of regularly spelled patterns such as consonant-vowel-consonant (CVC) (hop), consonant-vowel-consonant-silente (CVCe) (hope), and one-syllable words with blends (drop). | • | • |
| Spell multisyllabic words using regularly spelled phonogram patterns. | • | • |
| Write with more proficient spelling of inflectional endings, including plurals, past tense, and words that drop the final e when such endings as -ing, -ed, or -able are added. | | • |
| Write with more proficient use of orthographic patterns and rules such as oil/toy, match/speech, badge/cage, consonant doubling, dropping e, and changing y to i. | • | • |

| *Content Standards and Objectives* | *CA* | *TX* |
|---|---|---|
| Write with more proficient spelling of contractions, compounds, and homonyms such as hair-hare and bear-bare. | • | • |
| Write with accurate spelling of syllable constructions such as closed, open, consonant before -le, and syllable boundary patterns. | | • |
| Spell words ending in -tion and -sion such as station and procession. | | • |
| Use resources to find correct spellings, synonyms, or replacement words. | • | • |
| **The** student composes meaningful texts applying knowledge of grammar and usage. | • | • |
| Use correct irregular plurals such as sheep. | | • |
| Use singular and plural forms of regular nouns and adjust [subject and] verbs for agreement. | • | • |
| Compose elaborat sentences in written texts and use the appropriate end punctuation. Understand and be able to use complete and correct declarative, interrogative, imperative, and exclamatory sentences in writing and speaking.] | • | • |
| Compose sentences with interesting elaborate subjects. | | • |
| Edit writing toward standard grammar and usage, including subject-verb agreement; pronoun agreement, including pronouns that agree in number; and appropriate verb tenses, including to be, in final drafts. | • | • |
| [Create a single paragraph that has a topic sentence and includes simple supporting facts and details.] | • | |
| **The student selects and uses writing processes for self-initiated** and assigned writing. | • | • |
| Generate ideas for writing by using prewriting techniques such as drawing and listing key thoughts [prewriting]. | • | • |
| Develop drafts. | • | • |
| Revise selected drafts for various purposes, including to achieve a sense of audience, precise word choices, and vivid images. [Revise drafts to improve the coherence and logical progression of ideas by using an established rubric.] | • | • |
| Edit for appropriate grammar, spelling, punctuation, and features of polished writing. | • | • |
| Use available technology for aspects of writing such as word processing, spell checking, and printing. | | • |

| *Content Standards and Objectives* | *CA* | *TX* |
|---|---|---|
| Demonstrate understanding of language use and spelling by bringing selected pieces frequently to final form, "publishing" them for audiences. [Note: "publishing" is not explicit in CA but is a typical feature of "writing process" that CA, like Texas, espouses.] | • | • |
| The student evaluates his/her own writing and the writing of others. | | • |
| Identify the most effective features of a piece of writing using criteria generated by the teacher and class. | | • |
| Respond constructively to others' writing | | • |
| Determine how his/her own writing achieves its purposes. | | • |
| Use published pieces as models for writing. | | • |
| Review a collection of his/her own written work to monitor growth as a writer. | | • |
| The student uses writing as a tool for learning and research. | • | • |
| Write or dictate questions for investigating | | • |
| Record his/her own knowledge of a topic in a variety of ways such as by drawing pictures, making lists, and showing connections among ideas. | | • |
| Take simple notes from relevant sources such as classroom guests, books, and media sources. | | • |
| Compile notes into outlines, reports, summaries, or other written efforts using available technology. | | • |
| [Understand the structure and organization of various reference materials, e.g., dictionary, thesaurus, atlas, and encyclopedia.] | • | |

**Again,** there is significant overlap in the two states' standards in the language arts. Of the 19 language arts content standards only two are not explicitly shared by **both** states.

# II



## MEXICAN CURRICULA AND STANDARDS

Until recently, the Mexican educational system was characterized by strong centralization that placed every aspect of education under the direction of the Mexican Department of Education (Secretaria de Educación Pfiblica). This had advantages. An educational system principally sustained by the federal government was indispensable in reversing an illiteracy rate of 85% at the beginning of the 20th century. It was extremely useful in overcoming the administrative weakness of the states and in guaranteeing a common focus. Strong centralization lead to the development of an educational system and infrastructure capable of serving 100% of the demand for elementary education (Zorrilla, 1998). Nevertheless, centralization also had major disadvantages. It created an enormous bureaucracy that, by applying uniform decisions nationwide, did not always meet the needs of every region or state. Zorrilla (1998) points out that the central governing organization, the Secretaría de Educación Pfiblica, became "una organización burocrlitica y vertical alejada de la escuela y de sus necesidades" [a vertically bureaucratic organization distanced from the schools and their needs] (p. 327).

In 1978 some decentralization of educational administration occurred with the creation of branches of the Secretaria de Educación Pfiblica in each of the Mexican states. But it was not until 1992, with the Agreement on the Modernization of Elementary Education (Acuerdo de la Modernización de la Educación Blisica y Normal), that the educational system itself was decentralized to any degree. The Acuerdo established four strategic lines for the modernization of education: reorganization of the educational system, reformulation of education content and materials, social participation in education, and reassessment of the educator's function (Southwest Educational Development Laboratory, 1995). The first two lines of reform, the most germane for the purposes of this monograph, are described briefly here.

In the reorganization of the educational system decentralization was a major focus. The federal Secretaría de Educación Pfiblica now shares educational responsibilities to a far greater extent with state governments. The Secretaria

maintains substantial control over aspects of the educational system. Among these aspects are the responsibility of standardizing education, developing curricula for both elementary and secondary education, authorizing the use of educational materials, and providing free textbooks. It is also in charge of the educational budget and the distribution of financial resources earmarked for education (Petrovic et al., 1999, Southwest Educational Development Laboratory, 1995). The duties that have fallen to the states include directing state schools, assuming responsibility for the technical, administrative, and fmancial aspects of providing education, forming collegiate/professional councils, and maintaining and equipping schools (Andrade de Herrera, 1996).

The second line of reform, the reformulation of content and materials, is not dissimilar to the standards movement in the United States. It represents an effort to bring curriculum in line with what is known about how children learn and with modem conceptions of the role of school in society. During this effort the Mexican Deputy Secretary of Education contended that the reformulation of content and materials "ensures the imparting of the essential basic knowledge and the cultivation of skills, intellectual habits, and personal and social values ... in a way that creates greater coherence and integration between primary and secondary school" (Southwest Educational Development Laboratory, 1995). Effecting these changes required a complete renovation of the national curriculum and textbooks.

One of the goals of the curricular renovation was "to establish a common frame of work in all of the nation's schools" (Secretaria de Educación Piiblica, 1993, p. 10). The implementation of this new "frame" began in the 1993 academic year. It is important to note that the reformulation included an increase in the number of school days per academic year to 200, and an increase in instructional hours in mathematics and Spanish language arts at both the elementary and secondary levels (Andrade de Herrera, 1996).

*Mathematics*

In the new curriculum, mathematics was given greater attention than it had received in the past. In fact, in the first and second Grades a third of instructional time is dedicated to math: 6 hours of the 20-hour week. From the third to sixth grades, a full quarter of weekly instructional time is dedicated to math (Secretaria de Educación Piiblica, 1993).

The general objectives of the mathematics curriculum are to develop:

- The capacity to utilize mathematics as a tool to recognize, plan, and solve problems,
- The capacity to anticipate and verify results,
- The capacity to communicate and interpret mathematical information,
- Spatial imagination,
- The ability to estimate the results of calculations and measurements,
- Skill in the use of tools and technology in measurement, drawing, and calculation, and
- Abstract thinking through distinct forms of reason, including systematization and generalization of procedures and strategies.

These objectives are realized through instruction in specific mathematics content organized in six general areas (*ejes temáticos*): (1) numbers, relationships, and operations, *(2)* measurement, *(3)* geometry, (4) processes of change, including rudimentary reasoning and proportion, *(5)* data collection and organization, and (6) prediction and chance. Most of these areas include several sub-topics.

The following tables summarize the content standards for first-, second-, and third-grade mathematics. It is important to point out that area four, processes of change, is not covered in these three grades. Coverage of area six (prediction and chance) does not begin until third grade.

**Table 13. Mathematics (First Grade)**

| **Area 1: Numbers, relationships, and operations** |
|---|
| Sub-topic: Whole numbers |
| Content standards: |
| • Reading and writing numbers from 1 to 100 |
| • Counting from 1 to 100 |
| • Grouping by tens and ones |

- Forming simple equations
- Identifying numbers in a series (e.g., numbers that come before/after a given number)
- Recognizing place values
- Planning and solving simple addition and subtraction problems involving single-digit numbers (using diverse procedures, including conventional algorithmic procedures)
- Identifying ordinal numbers

**Area 2: Measurement**

Sub-topic: Length and area

Content standards:

- Comparing lengths directly or with standard units (e.g., this pencil is as long as three paper clips)
- Comparing surface areas of figures (e.g., by covering one object with another)

Sub-topic: Capacity, weight, and time

Content standards:

- Making direct comparisons of the volumes of vessels
- Making direct comparisons of the weights of objects
- Using scales to compare the weights of objects
- Measuring the volumes and weights of objects using non-standard units of measurement (e.g., this boy weighs as much as two desks)
- Using time expressions in association with daily activities (before, after, yesterday, today, tomorrow, morning, afternoon, and night)
- Identifying activities that occur in a week

**Area 3: Geometry**

Sub-topic: Locating objects in space

Content standards:

- Identifying one's location in relation to the environment
- Identifying one's location in relation to other people and objects
- Identifpng the location of other people and objects
- Using the expression of location (e.g., above, below, in front of, behind, right, left)
- Representing movement between points on a map

Sub-topic: Shapes and Figures

Content standards:

- Representing objects in the student's immediate environment using diverse procedures (e.g., a chair can be represented by the word, by a picture, or by another object)
- Classifpng objects by diverse criteria (e.g., things that roll)
- Constructing shapes and figures through diverse media (e.g., clay)
- Recognizing, identifying, and drawing shapes (circles, squares, rectangles) (using a ruler to draw shapes)
- Identifpng straight and curved lines on everyday objects

**Area 4: Data Collection and Organization**

Content standards:

- Planning and solving simple problems that require the collection and organization of information using graphs and tables
- Solving problems and forming questions that can be represented in illustrations

**Table 14. Mathematics (Second Grade)**

**Area 1: Numbers, relationships, and operations**

Sub-topic: Whole numbers

Content standards:

- *Reading, writing, and counting three-digit numbers
- •Grouping in hundreds, tens, and ones
- •Forming simple equations
- •Identifying numbers in a series
- •Recognizing place values
- •Using ordinal numbers in familiar contexts
- *Planningand solving addition and subtraction problems with numbers having up to three digits (using a variety of procedures including conventional algorithmic procedures)
- *Solving multiplication-type problems using diverse procedures (e.g., by grouping)
- *Constructing multiplication tables. Planning and solving division problems using diverse procedures (e.g., sharing objects)

**Area 2: Measurement**

Sub-topic: Length and area

Content standards:

- •Measuring length and surface using non-standard units of measurement
- *Comparingand ordering various lengths and areas
- *Usinga ruler to compare lengths

Sub-topic: Capacity, weight, and time

Content standards:

- •Using scales to compare the weights of objects
- •Measuring *the* volumes and the weights of objects using non-standard units of measurement
- *Comparingand ordering objects and vessels according to their weights and volume
- *Usinga calendar to identify months, weeks, and days

**Area 3: Geometry**

Sub-topic: Locating objects in space

Content standards:

- Locating one's self in his/her surroundings
- Locating one's self in relation to other people and objects
- Locating objects among other objects
- Directions (north, south, east, west)
- Representing movement and location on a map (reconstructing routes or paths, e.g., in a maze, taking into consideration points of reference)

Sub-topic: Shapes and figures

Content standards:

- Representing everyday shapes and objects
- Classifying shapes and objects by specific criteria
- Constructing shapes and figures using cubes and other basic shapes and figures
- Drawing shapes using a ruler
- Drawing and construction of pictures or forms using shapes

**Area 4: Data collection and organization**

Content standards:

- Interpreting information from illustrations, charts, and simple graphs
- Inventing and solving simple problems drawn from data in picture form

-Inventing problems based on numerical expressions and equations

**Table 15. Mathematics (Third Grade)**

**Area 1: Numbers, relationships, and operations**

Sub-topic: Whole numbers

Content standards:

*Counting, reading, and writing five-digit numbers

*Identifying numbers in a series

*Grouping in thousands, hundreds, tens, and ones

*Forming a simple equation

•Recognizing place values

*Reading and writing of ordinal numbers

•Planning and solving more complex addition and subtraction problems involving three-digit numbers, including problems that lack information and/or require two operations to solve

*Planning and solving multiplication problems with two-digit numbers and numbers that end in zero (using a variety of procedures including conventional algorithmic procedures)

*Planning and solving division problems with three-digit numbers using non-conventional procedures (e.g., using pictures or other procedures/strategies)

*Solving division problems (dividing a two-digit number by a single digit) using conventional algorithmic procedures

Sub-topic: Fractions

Content standards:

*Understanding simple fractions (halves, quarters, and eighths) through dividing activities (e.g., cutting a pie) and measurements of length

*Comparing simple fractions represented by concrete objects

*Recognizing conventional representations of fractions (e.g., ½)

*Planning and solving problems that add simple fractions using manipulatives

**Area 2: Measurement**

Sub-topic: Length and area

Content standards:

- Measuring and comparing areas using non-standard units of measurement (e.g., using smaller squares to measure larger ones)
- Solving simple problems that include the use of conventional units of measure including meter, centimeter, and square centimeter.
- Comparing and ordering lengths and areas using conventional measurement
- Solving simple problems that include measurement of lengths using half a meter and a quarter meter
- Solving simple problems that include the use of measurement tools (e.g., ruler)

Sub-topic: Capacity, weight, and time

Content standards:

- Measuring weight and volume using kilo, half kilo, quarter kilo, liter, half liter, and quarter liter
- Measuring time in years, months, weeks, and days
- Using the calendar to plan activities and identify dates
- Reading a non-digital clock by both the hour and minute hands, and using the expressions half an hour and quarter of an hour

**Area 3: Geometry**

Sub-topic: Locating objects in space

Content standards:

- Representing the location of things in the student's immediate environment on a map
- Representing the relocation of objects on a map taking into account reference points

- Designing, reading, and interpreting maps or plans (e.g., of the classroom)
- Observing and representing objects from different perspectives

Sub-topic: Figures and shapes

Content standards:

- Identifying characteristics of figures and shape (e.g., number of sides)
- Constructing cubes
- Making graphic representations of shapes and figures
- Classifying quadrilaterals and triangles (e.g., by the (non)equality of their sides, parallelism, perpendicularity, and symmetry)
- Construction and transformation of figures by the use of other figures
- Identifying and outlining points of symmetry in figures
- Using a ruler to outline lines and figures

**Area 4: Data collection and organization**

Content standards:

- Planning and solving simple problems that requite periodic collection and recording of information
- Inventing and editing questions based on numerical information given in written materials
- Solving and inventing questions and simple problems that can be solved by data given in a chart, table, or other numerical illustration

**Area 5: Prediction and chance**

Content standards:

- Predicting facts and occurrences in situations that preclude chance happening
- Identifying and engaging in games that do and do not include chance

*Reading/Language Arts*

While the emphasis on math in the new curriculum was increased, highest priority is given to reading, writing, and oral expression. In fact, in first and second grades 45% of instructional time is dedicated to Spanish reading and language arts. From the third through sixth grades a third of school time is dedicated specifically to Spanish reading/language arts and, additionally, "the systematic use of [reading/language arts] is intensified in other subjects" (Secretaria de Educación Pública, 1993, p. 14).

An important change in the new curriculum as concerns reading/language arts was a switch from emphasizing grammar and structure to emphasizing written and oral communication skills (1993, September, pp. 14 & 23). In this vein, the general objectives of the reading/language arts curriculum are for students to:

- Effectively learn how to read and write,
- Develop the capacity for clear, coherent, and natural oral expression,
- Be able to distinguish among diverse types of text and to use appropriate strategies for reading,
- Develop regular reading habits and become readers who can reflect on the meaning of text and evaluate it, while enjoying reading and forming their own criteria and preferences for materials,
- Develop the ability to revise and correct their own writing,
- Be familiar with the rules and norms of language use and to be able to apply them in order to achieve clarity and efficiency in communication, and
- Know how to search for information, evaluate, process, and use it in and outside of school as an instrument for self-instruction and learning.

These objectives are met through combined instruction and activities in four general areas: spoken language, written language, literary recreation, and reflection on language. The first area refers to the development of oral communication skills. In the early grades, this typically consists of promoting fluency, clarity of expression, and diction. From third grade, students are introduced to more formal modes and styles of expression as in argumentation or debate. The second area refers to development of both reading and writing skills. The third area refers to the promotion in children of the

"enjoyment of various literary genres and the feeling of participation and of creation that literature awakens" (1993, September, p. 28). The fourth area includes the basics of grammar and linguistics. It should be pointed out that in each of these areas, which are synergistic, the Secretaria de Educación Pública promotes a holistic approach noting that "los niños aprend[en] a Leer *leyendo*, a *escribir escribiendo* y a *hablar hablando*" [children learn to read by reading, to write by writing, and to speak by speaking] (1993, September, p. 25, emphasis in original).

The following tables summarize the content standards for first, second, and third grade reading/language arts.

**Table 16. Reading/Language Arts (First Grade)**

**Area 1: Spoken language**

Sub-topic: Understanding, skills, and attitudes

Content standards:

.Developing proper pronunciation and fluency in oral expression; Predicting sequence in written material

*Comprehending and delivering orders and instructions

•Expressing ideas and remarks

Sub-topic: Communicative situations

Content standards:

•Conversing about a variety of topics, reading, and preferences as concern radio and television programs

•Presenting in front of a group

.Reporting, individually and collectively, about experiences and local events

•Describing pictures in books in order to anticipate content

•Playing description games that require describing and guessing the object

-Simulating interviews

•Expressing opinions

•Acting out, non-verbally, verbal messages

.Understanding instructions through participation in games that require giving and understanding orders

**Area 2: Written language**

Sub-topic: Understanding, skills, and attitudes

Content standards:

- Writing **all** the letters of the alphabet in both print and script styles
- Understanding the directionality of written language
- Understanding the separation of words
- Understanding spacing between printed letters
- Identifying the *punto final* and *punto y aparte* (These are both references to the "period." See p. 88 for explanation.)
- Comprehension of sentences and short passages/books
- Reading aloud from texts and other printed matter
- Recognizing writing as a form of communication

Sub-topic: Communicative situations

Content standards:

- Interpreting illustrations
- Comparing words according to their number of letters and their first letter
- Comparing words in order to discover/understand conventional representation of letters
- Locating known words in text
- Identifying and reading familiar words
- Reading and commenting on short passages written by the students
- Listening to and following readings done by the teacher and other students
- Exploring a variety of written materials
- Writing one's own name
- Writing words and sentences
- Composing and illustrating text

- Composing messages using drawings and words
- Editing and correcting one's own text with attention to the use of capital letters in proper nouns and period use

**Area 3: Literary recreation**

Sub-topic: Understanding, skills, and attitudes

Content standards:

- Attending and following along to text read aloud
- Participating in readings carried out by the teacher
- Caring for books

Sub-topic: Communicative situations

Content standards:

- Listening to children's stones narrated or read by the teacher
- Drawing pictures that represent the stories heard
- Participating in the reading that the teacher is presenting, anticipating words and content based on what has been heard
- "*Lectura comentada*" from illustrated texts'
- Creating collectively stories and dialogues based on reading from other texts
- Creating rhymes based on others already known
- Changing the ends of stories
- Participating in games, rounds, and songs
- Reciting rhymes and poems
- Acting out the characters known from stones
- Staging stories using puppets and masks made by the students
- Reciting tongue-twisters and solving riddles

[1] ***Lectura comentada*** is one of several ways of doing reading activities. Others include ***audicidn de la lectura*** (listening to stories read aloud), ***lectura guiada*** (guided reading, ***in*** which the teacher guides comprehension by asking pertinent questions that foreshadow or lead to predictions), ***lectura compartida*** (shared reading, similar to guided reading with a student doing the guiding in a small group), and ***Iectura independiente*** (independent reading). ***Lectura comentada*** is a small group activity in which students read a story and make comments both during and after the reading, thus allowing them to hear other interpretations or reactions that may give them greater insight to the reading or raise information that they may have missed.

**Area 4: Reflection on language**

Sub-topic: Understanding, skills, and attitudes

Content standards:

- Beginning to recognize and use endings that indicate gender and number
- Observing word order in sentences
- Identifying and using some synonyms
- Identifying and using affirmative and negative sentences

**Table 17. Reading/Language (Second Grade)**

**Area 1: Spoken language**

Sub-topic: Understanding, skills, and attitudes

Content standards:

- Improving pronunciation and fluency of expression
- Improving fluency in dialogue and conversations
- Beginning to expound upon specific themes or topics
- Formulating questions about specific themes or topics

Sub-topic: Communicative situations

Content standards:

- Exchanging opinions in small groups about the content of texts and other materials, preferences of radio and television programs, and other collectively chosen topics
- Talking about familiar stories and personal anecdotes
- Telling about occurrences and experiences or real or fictional stories while including characters and following chronological sequence
- Describing objects, people, places, and illustrations in books highlighting important features
- Playing guessing games requiring description

- Engaging in discussions to form consensus on common points of interest
- Presenting in front of the group on previously agreed upon topics
- Formulating questions to ask classroom guests

**Area 2: Written language**

Sub-topic: Understanding, skills, and attitudes

Content standards:

- Reading and writing sentences and short passages
- Reading different kinds of text, identifying the differences between them
- Anticipating the content and sequence of texts based on its beginning
- Identifjmg the theme of a text
- Writing stories about themes derived from reading descriptions and/or the beginning of a story
- Writing questions about predetermined themes/topics
- Recognizing the use of space between words
- Using capital letters in proper nouns, after a period at the beginning of a sentence
- Identifjmg question marks
- Understanding written instructions

Sub-topic: Communicative situations

Content standards:

- Reading signs in the community
- Listening to readings done by the teacher
- Deduction of the theme of a story or text by observing the illustrations
- Comprehending brief written instructions to play games
- Reading short passages aloud

- Composing, individually and in groups, signs and other postings similar to those seen in the community
- Composing questions about a theme determined by the students
- Composing comments/responses formed in small groups about the theme of text read by the teacher
- Composing and exchanging messages, advice, and letters between friends in the class or school
- Writing descriptions of mental images
- Revising and self-correcting text and verifying the use of capital letters, periods, and word-spacing

**Area 3: Literary recreation**

Sub-topic: Understanding, skills, and attitudes

Content standards:

- Listening to text
- Participating in readings done by the teacher
- Composing and reading poems and stories
- Caring for books
- Understanding the meaning of traditional refrains, phrases, and sayings
- Discussing the meaning of traditional refrains, phrases, and sayings

Sub-topic: Communicative situations

Content standards:

- Listening to stories, legends, and poems read by the teacher
- Reading stories and poems to each other (students)
- Composing and reading aloud poems and stories
- Exchanging self-authored materials for friends to illustrate
- Composing, individually and in small groups, stories and illustrating them
- Creating rhymes using lists of words given by the teacher

- Changing the dialogues of short stories to create different stories
- Presenting the changed end of story aloud
- Portraying a story through drawings
- Portraying the theme of text via dialogue and mime

**Area 4: Reflection on language**

Sub-topic: Understanding, skills, and attitudes

Content standards:

- Using endings that indicate gender and number
- Identifying the subject of a sentence
- Identifying affirmative and negative sentences
- Observing correct word order in sentences
- Identifying certain synonyms and antonyms
- Expanding vocabulary by grouping words according to their meaning or relationship

Sub-topic: Communicative situations

Content standards:

- Engaging in word games to change the principal character in a story
- Revising and correcting text
- Make word groups or classifications that reflect the student's environment such as jobs, animals, fruits, and school objects
- Using these new words in stories and other writings

**Table 18: Reading/Language Arts Content Standards (Third Grade)**

**Area 1: Spoken language**

Sub-topic: Understanding, skills, and attitudes

Content standards:

- Speaking fluently in dialogue, narrations, descriptions, and remarks on given topics

Expounding on topics using a variety of supporting materials and graphic resources

Understanding the use of tone and volume in different communicative settings/situations

Understanding norms of conversation (e.g., turn-taking)

- Planning and carrying out interviews

Sub-topic: Communicative situations

Content standards:

- Reporting happenings and experiences, either fictitious or real, including characters and following chronological order
- Describing objects, people, places, and illustrations paying attention to detail and highlighting important features and attitudes of people
- Having group discussions on agreed upon topics of interest
- Expounding on topics from other school classes and subjects
- Simulating situations to carry out fictitious interviews

**Area 2: Written language**

Sub-topic: Understanding, skills, and attitudes

Content standards:

Reading aloud one's own writings and those of friends and passages from books

- Composing summaries
- Exchanging written messages with other students

Identifying elements of a letter: sender and addressee

- Understanding a variety of uses of alphabetic order
- Understanding the utility and how to use a dictionary
- Identifying the main parts of a book
- Identifying the main parts of a newspaper
- Searching for information in a reference book
- Constructing rudimentary bibliographies (with author and title)
- Reading simple instructions

- Dividing words into syllables
- Using the letters "*R*," "*r*," and "*rr*"
- Using the syllables "*ca*," "*co*," "*cu*," "*que*," and "*qui*"
- Using the letters "*b*," "*y*," and "*v*"
- Using the syllables "ga," "go," "*gu*," "*gue*," "*gui*," "*güe*," and "*güi*"
- Using question marks and exclamation points
- Using commas

Sub-topic: Communicative situations

Content standards:

- Exchanging written messages
- Composing descriptions and narrations based on individual themes or those decided by the group
- Revising and self-correcting text with the use of a dictionary
- Writing instructions for various purposes
- Comprehending and following instructions to carry out a variety of activities (e.g., to assemble something, to play a game, to do an experiment)
- Identifying different types of text used in the school and community (e.g., signs, lists, advertisements, messages, warnings, announcements)
- Comparing the newspaper with other printed matter
- Keeping a personal dictionary with definitions written by the student
- Recognizing the usefulness of the title and subtitles of text and incorporating them in student writing
- Composing summaries after having identified the main ideas of a text
- Classifying books and materials in the school or classroom library

Area 3: Literary recreation
Sub-topic: Understanding, skills, and attitudes

Content standards:

- Appreciating and exploring the meaning of tongue-twisters, riddles, sayings/refrains, jokes, songs, poems, and legends of traditional and popular literature
- Creating different versions of the same story on a given theme
- Creating literary text individually and in groups
- Representing (acting out) stories

Sub-topic: Communicative situations

Content standards:

- Reading, individually, in pairs, or in groups, books available in either the classroom or school library
- Researching songs, poems, and verses among relatives and other friends
- Changing stories by modifying the ending, a character, or situation
- Choosing a topic to write a story about
- Collecting tongue-twisters, riddles, sayings, and jokes and comparing them, identifying their characteristic elements

Area 4: Reflection on language
Sub-topic: Understanding, skills, and attitudes

Content standards:

- Recognizing indigenous words that are commonly used and the local Spanish spoken
- Identifying the subject and predicate in sentences
- Recognizing and using nouns and qualifying adjectives

  Recognizing and using verbs and tenses (present, past, and future)
- Recognizing interrogative and exclamatory sentences
- Identifying synonyms and antonyms

- Recognizing and using homonyms
- Broadening vocabulary by building understanding of semantics (e.g., understanding the meanings of a variety of affixes and other word parts)

Sub-topic: Communicative situations

Content standards:

- Applying **all** of the previous standards in other content areas

# III

## COMPARING MEXICAN AND U.S. ELEMENTARY CONTENT STANDARDS AND OBJECTIVES

Parts I and II outlined the standards and objectives for mathematics and reading/language arts. In this part of the monograph, the content standards and objectives are brought together in a comparison. Here, the most important differences between the Mexican and U.S. content standards and objectives are highlighted. There are several basic questions that this comparison will answer: (1) Are U.S. and Mexican first, second, and third graders required to cover the same or similar information and to achieve similar skills? (2) Are they required to cover this information at the same time (i.e., at the same grade level)? And, **(3)** do they cover it in the same or similar depth or at the same level of complexity?

To reiterate, the goal is not to judge which country(ies) have good or bad curricula but to analyze and compare them. For the purposes of this monograph, we want to focus on whether students in Mexico and the United States are studying similar material in mathematics and whether the curriculum is similar in scope (breadth and depth) and sequence in the primary grades. Because this is only a preliminary exploration, we do not expect to reach definitive answers to these questions.

*Mathematics*

Here the content standards documented in the two previous parts of the monograph as well as textbooks are used as the points of comparison and sources of information. This type of comparison is not new, especially in regard to math. The most widely referenced comparison of this type is the Third International Mathematics and Science Study (TIMSS). The analyses in TIMSS focus on the teaching and learning of mathematics and science at three levels. The first "population" consisted of students enrolled in the two adjacent grades that had the largest portion of nine-year-olds. The second "population" consisted of students enrolled in two adjacent grades that had the largest portion of 13-year-olds. The third population consisted

of students in their final year of secondary education (Schmidt et al. 1997b). Thus, TIMSS pays very little attention to first and second grades and does not provide direct grade-level curricular comparisons. What the TIMSS does tell us, very generally, about math in the first, second, and third grades is that the curriculum is "primarily one of number, measurement, and simple geometry. 'Data representation' [is] also common" (Schmidt et al. 1997b, p. 17).

As we saw in the previous sections, this portrayal is accurate if vague. Recall that the U.S. mathematics standards (as based on the California standards) are divided into five general areas: number sense; algebra and functions; measurement and geometry; statistics, data analysis, and probability; and mathematical reasoning.[1] The Mexican standards are divided into six general areas: numbers, relationships, and operations; measurement; geometry; data collection and organization, prediction and chance; processes of change. To reiterate, only the first four are covered in grades one and two with the fifth being added in third grade. "Processes of change" does not appear until fourth grade.

The Mexican classifications collapse some of the U.S. ones and separate others. The classifications generally correlate as follows for the first through third grades:

| U.S. | | Mexico |
|---|---|---|
| 1. Number Sense<br>2. Algebra and Functions | = | 1. Numbers, Relationships, and Operations |
| 3. Measurement and Geometry | = | 2. Measurement<br>3. Geometry |
| 4. Statistics, Data Analysis, Probability | = | 4. Data Collection and Organization<br>5. Prediction and Chance |
| 5. Mathematical Reasoning | = | Not explicitly stated |

Given this close match, the major differences and similarities between the mathematics content standards will be presented under four composite area headings: Number Sense and Algebraic Functions; Measurement and Geometry; Statistics, Data, and Probability; and Mathematical Reasoning. The discussion is further divided by grade level.

[1] Recall that the Texas standards are divided into 7 general areas that were fitted into the California framework.

*First Grade*

*Number Sense and Algebraic Functions*

Looking back on Tables 1 and 13 we see that the vast majority of the U.S. standards under the heading of Number Sense are also covered in the Mexican standards. There are some differences, however, that merit mention:

First, both California and Texas cover the value of coins, including the value of different combinations of coins. In first grade, the coins covered are pennies, nickels, and dimes (in support of the emphasis on skip counting and grouping in these same quantities). Textbooks tend to provide realistic images of these coins. The Mexican coverage of this same content is somewhat less sophisticated in the sense that the "coins" represented are not realistic and, therefore, the tasks involving the use of these coins lack a certain amount of authenticity. (Here I am referring only to the tasks presented in the textbook. It may be the case that teachers provide students with real coins for other tasks.)

Second, both California and Texas require first graders to skip count by 2s, 5s, and 10s. The Mexican first-grade standards and text only cover counting by ones and skip counting by 3s, 5s, and 10s. Interestingly, skip counting by 2s is not covered.

Third, California, but not Texas, requires the solving of "addition and subtraction problems with one- and two-digit numbers." The Mexican standards explicitly require solving problems with one-digit numbers. However, the textbook introduces—albeit very briefly—problems with two two-digit numbers.

Fourth, Texas introduces fractions in first grade, and both California and Texas cover fractions in second grade. Fractions are not introduced in the Mexican standards until third grade.

Finally, all sets of standards cover the basic algebra that would be expected at this level: writing and solving number sentences. Although only California explicitly mentions "understanding the meaning of the symbols +, -, =," this is implicitly and necessarily part of the standard of being able to write and solve mathematical sentences. Most importantly in this area is the fact that the Mexican standards and text never ask children to "create problem situations that might lead to given number sentences involving addition and subtraction." In other words, Mexican first graders are asked to solve problems but not to create them. This standard is explicit in both California

and Texas. This standard is explicit in the two upper grades in Mexico. Creation of problems is introduced in the second grade text but the "situation" is usually supplied (1994, September, p. 17). Mexican children at the first grade level are asked more frequently to design problems/questions which will elicit information to be placed into data tables than to design mathematical word problems.

*Measurement and Geometry*

There are very few important differences between the Mexican and U.S. mathematics curricula in measurement and geometry. Under the topic of measurement, "telling time to the nearest half hour" is specified in both the California and Texas standards but not in the Mexican standards. Contrarily, "using time expressions in association with daily activities" and 'identifying activities that occur in a week" are explicit in the Mexican standards but not in the U.S. ones. These topics do arise, however, in certain U.S. math texts in the second grade (e.g., in *Math Advantage* by Harcourt Brace).

Under the topic of geometry, the Mexican standards seem to place much greater emphasis on identifying location (e.g., one's location in relation to the environment). The U.S. standards approach this somewhat differently by having children identify the location of other objects, but not necessarily in relationship to themselves. One other difference is the Mexican emphasis on "representing movement between points on a map." This consists of, for example, leading a duck through a maze to a pond. This is not explicit in the U.S. standards but is covered in certain U.S. texts to a similar degree as the Mexican text

A final difference is the Mexican standard of "identifying straight and curved lines on everyday objects." This is mentioned neither in the California nor Texas standards.

*Statistics, Data, and Probability*

With the exception of the notions of "certainty" and "impossibility," the same standards under the "statistics, data, and probability" heading are covered in California, Texas, and Mexico. Nowhere-in the Mexican standards or text are the notions of certainty and impossibility covered. Interestingly, this is the case at **all** three grade levels.

Another important difference is the emphasis in the United States on repeating patterns, both numerically and pictorially (e.g., shapes and colors). This topic is not explicit in the Mexican standards. It is, however, covered in the text, albeit with somewhat less emphasis than in California and Texas.

*Mathematical Reasoning*

In Table 1, the mathematical communication standards that Texas outlines have been included under the heading of "Mathematical Reasoning." Neither California nor Mexico includes explicit standards regarding the ability of students to explain everyday mathematics or relate informal language to mathematical symbols. Such skills are, however, typically part of instructional strategies. It is not a stretch to conclude that teachers in both the United States and Mexico often ask children to explain their mathematical operations in "their own words." Indeed, both California and Texas require that students be able to "explain the reasoning used and justify the procedures selected." This recommendation, while not in the Mexican standards, does appear in the first grade teachers manual where teachers are told that they "should help [students] explain the procedures that they followed until [the students] learn how to explain and defend their procedures by themselves" (1994, September, p. 31).

*Second Grade*

*Number Sense and Algebraic Functions*

Most of the standards under "Number Sense and Algebraic Functions" overlap in California, Texas, and Mexico at the second grade. There are three standards in Mexico that are not explicit in Texas or California: Using ordinal numbers in familiar contexts; grouping in hundreds, tens, and ones; and, constructing multiplication tables. Interestingly, ordinal numbers are not mentioned in the U.S. standards. They are, however, presented in a number of texts. "Grouping" (by ones and tens) is explicit in the first grade but not in higher units in later grades. Finally, the "construction" of multiplication tables is not explicit but the memorization of the tables for twos, fives, and tens is (at least in California).

Beyond these small differences, there are three more important differences that surface in "Number Sense" in second grade. First, and this seems to be true throughout the three grades, there is less emphasis in the Mexican standards on "fact families." Fact families are emphasized in both Texas and California and are represented frequently in common texts.

Second, the introduction of fractions occurs earlier in the United States. Recall that in Texas the notion of "fractions" was introduced in first grade. In second grade, both California and Texas begin more advanced coverage of fractions. Similar coverage does not begin in Mexico until the third grade and then it begins with the most common fractions (e.g., 1/8, 1/4, %).

Third, second graders in the United States are introduced to the use of combinations of coins and bills. This includes introduction to the dollar and cent symbols and to the use of decimals to denote fractions of dollars. As noted under first grade, the use of money is less sophisticated in the Mexican standards and text. This is still the case in second grade. In fact, the dollar symbol does not appear until third grade and representations of money, even at third grade, do not include use of decimals.

*Measurement and Geometry*

In second grade "Measurement and Geometry," there are four differences in the standards worth noting. First, in the Mexican standards there is a continuation from the first grade on comparing and ordering lengths and areas. In the United States, "area" is not mentioned until the third grade at which time the formal mathematical calculation of area also begins. Formal calculation of area also begins in the third grade in the Mexican standards.

The difference is that Mexican students seem to spend much more time comparing areas, using non-standard units of measurement, before they begin to do the more formal calculations.

Second, second graders (in California) are expected to measure the length of an object to the nearest inch and/or centimeter, i.e., using a standard ruler. Mexican second graders also measure and compare the lengths of objects. However, they still use non-standard units and/or construct rulers designed on non-standard units. For example, they might mark off twelve points on a piece of paper with the distance between each point equal to a paper clip or other object. They then use this paper "ruler" to measure and compare other objects.

Third, recall that in first grade U.S. students tell time to the nearest half hour. In second grade, they are expected to tell time to the nearest quarter hour (as well as related information such as minutes in an hour, days in a month, etc.). Mexican students seem to learn to tell time somewhat later. In fact, clocks and tasks involving the manipulation of clock hands do not appear in the Mexican text until third grade.

Fourth, Texas requires that students in second grade be able to read a thermometer to gather data. (This is not explicit in the California standards.) Reading a thermometer is not introduced until third grade in Mexico. (Note that they learn to read thermometers on the Celsius scale.)

*Statistics, Data, and Probability*

Under "Statistics, Data, and Probability," there is only one important difference. In first grade, it was noted earlier that the Mexican standards do not include any mention of learning "certainty" or "impossibility." This omission continues in the second grade for notions such as "more likely" or "less likely," which are included in the Texas standards (but not the California ones).

*Third Grade*

*Number Sense*

Under "Number Sense" in third grade, there are several differences. The primary differences arise in two areas: the scope of mathematical operations and the coverage of fractions.

In the scope of mathematical operations, one difference is that in both California and Texas, students are expected to "find the sum or difference of two whole numbers between 0 and 10,000 (9,999 in Texas)." In Mexico, on the other hand, the addition/subtraction focus is on three-digit numbers. In multiplication there is also a slight difference. For example, in California there is the specification of multiplication of multi-digit numbers by one-digit numbers. In Mexico at this grade level, multiplication of two two-digit numbers is introduced.

The coverage of fractions at this grade level is similar. For example, students in both countries are asked to add simple fractions using manipulatives. An example of this sort of problem is: "Janis, Maija, and their mother were eating a cake. Janis ate ½ of the cake. Maija ate ¼ of the cake. Their mother ate ¼ of the cake. How much of the cake is left?"

One significant difference in the coverage of fractions is that California (but not Texas) requires that students know and understand the decimal equivalents of common fractions (e.g., 50 cents = ½ dollar). Mexican students have thorough exposure to the decimal system of money but this direct connection to fractions does not seem to be made. (Note that "decimal system" refers to the base-ten system of money and not to the use of the decimal point. Further, note that use of the decimal point typically occurs in U.S. math textbooks but not in the Mexican math textbook.)

*Measurement and Geometry*

Under "Measurement and Geometry" several minor points should be mentioned. First, at this grade level, students in Mexico begin to use standard units of measure, including meter, centimeter, and square centimeter. Recall that in the first two grades measurement occurred through the use of non-standard units. Second, in the California and Texas standards, third grade sees the first mention of "area." The practice of having students determine the area of a shape by covering them with smaller shapes begins much earlier in Mexico. At third grade in Mexico, standard square unit measurements are being introduced. Finally, the concept of "right angles" is introduced in California (but not Texas) in third grade but not in Mexico.

A more significant difference concerns the measurement of volume and capacity. Measuring both "liquid volume" and "volume of solid figures" is explicit in the third grade California standards. While capacity is introduced in first grade in Texas, volume does not appear in the standards until fifth grade. Capacity is also introduced in Mexico in first grade, while coverage of volume begins in fourth.

*Statistics, Data, and Probability*

Under "Statistics, Data, and Probability" recall that the U.S. standards introduced "certainty" and "impossibility" in first grade. In third grade, students are asked to "identify whether common events are certain, likely, unlikely, or improbable." At first glance this might seem to represent the Mexican topic of "Prediction and Chance" (*la predicción y el azar*). However, the Mexican coverage of this topic is focused somewhat differently "Chance" in the Mexican standards is much more related to the notion of "luck" as opposed to likelihood. For example, the U.S. standards focus on answering questions like "are you more likely to pull a red or green marble out of a bag with 15 green marbles and 5 red ones?" The Mexican standards focus

more on determining the difference between luck and strategy and knowing what kind of information is possible to know and which is not. For example, a specific objective in this area is for students to "observe the characteristics of certain games... and to analyze them through certain questions, such as "Is the game won through strategy or luck?" (1994b, September, p. 38).

*Summary and General' Observations*

This section has highlighted many of the differences between the otherwise rather similar content standards and objectives in the Mathematics curricula in Mexico and the United States (read: California and Texas). Some years ago, Macias (1990) reported:

> Mathematics content was more advanced than what my daughter, a third grader, was expected to learn in a 'good' public school in the United States. Among the concepts being taught at rnid-year were complex fractions in numerical, decimal, and word-problem form. (p. 301)

The present analysis does not support this conclusion. This is not to question the veracity of Macias' conclusion at the time. The point is that if this conclusion was accurate, it is no longer accurate—at least as reflected in this comparison of the explicit national and state standards. Also, the California Department of Education (1998) reports that "much of the content of the mathematics curriculum has been shifted into earlier grades, and mathematics instruction in kindergarten through Grade 7 is substantially strengthened." These changes, as well as the changes that have occurred in the mathematics standards in Mexico since Macias' report, explain in great part the different conclusion drawn here.

*Reading and Language Arts*

Unlike international studies of math and science such as TIMMS, little attention has been paid to language arts curricula in terms of international comparisons. This may be due to the perception that reading instruction in, say, Japanese and English are two such different animals as to make a comparison difficult and perhaps meaningless. Nevertheless, there will be, inevitably it seems to me, similarities in the skills, purposes, and goals of reading instruction even if the mechanics differ because of something as obvious as having a different lettering and/or writing system.

Furthermore, international comparisons are lacking even for countries that speak the same language. As should become evident, even for countries with different languages there is remarkable overlap in the language arts content standards and objectives. Often the only differences, in topics covered for example, relate directly to differences in language (e.g., article usage and number and gender agreement). And understanding why a Spanish-speaking student writes something like "eyes blues" can be important information for the English language-arts teacher. The sort of thorough contrastive analysis that this example alludes to is beyond the scope of this monograph. However, every effort has been made to point such differences out when they are explicit or obvious in the content standards and objectives.

Even though the language arts content standards and objectives are organized and classified differently in the United States and Mexico, the similarities among them are immediately apparent. In other words, the standards and objectives under each heading in Mexico easily collapse into the headings used in the United States and vice versa. The language arts content standards and objectives in Mexico are broken into four groups: those pertaining to "spoken language," "written language," "literary recreation," and "reflection on language." The U.S. headings are simply 'listening and speaking," "reading," and "writing." The Mexican heading of "reflection on language" mainly focuses on topics of grammar and vocabulary building. These things are, for the most part, reflected under the heading of "writing" in the U.S. content standards, although some are also included under "reading" (often in redundancy). In short, the headings or categorizations of the content standards and objectives outlined in sections I and II, correlate roughly as follows:

| U.S. | | Mexico |
|---|---|---|
| 1. Listening and speaking | = | 1. Spoken language |
| 2. Reading | = | 2. Literary recreation" |
| 3. Writing | = | 3. Written language<br>4. Reflection on language |
| * Inlcudes objectives that overlap with writing | | |

Given this close match, the major differences and similarities between the mathematics content standards will be presented under three headings: Listening and Speaking, Reading, and Writing. The discussion is further divided by grade level.

### *First Grade*

*Listening and Speaking*

With the exception of one, all of the content standards (in bold) in Table 4 are reflected in the Mexican standards. The objectives in the U.S. standards tend to be somewhat more specific and, therefore, more numerous. Two minor differences that surface are that (1) "simulating interviews" is explicit in the Mexican objectives but not the U.S. ones and (2) the Mexican standards refer specifically to radio and television programs as sources of discussion topics. This second difference is consistent through the three grades as the U.S. standards seem to ignore these rather obvious and omnipresent sources of information.

The exception to the overlap is that the Mexican standards make no mention of "listening and speaking to gain knowledge of one's own culture, the culture of others, and the common elements of cultures." The absence of this objective is consistent through the three grades. However, this objective was, recall, absent from the California standards as well.

*Reading*

In reading, there are three objectives in the Mexican content standards and objectives that are not explicit in the U.S. ones: "caring for books," "creating rhymes based on others already known," and "reciting tongue-twisters and solving riddles." Otherwise, all of the standards and objectives listed under the heading of "literary recreation" in Mexico are also listed in the U.S. reading standards. Again, the U.S. standards tend to be far more specific and, therefore, more numerous.

There are also three objectives that differ and are worth describing here. First, the Mexican standards require that first graders be able to identify and use affirmative and negative sentences. The California standards, but not the Texas standards, add exclamatory and interrogative to the types of sentences that first graders should be able to identify and use. Second, the Mexican objectives include "identifying and using some synonyms." The explicit mention of synonyms does not arise until the second grade in both California and Texas. Third, language difference leads to a standard in

Mexico that is irrelevant in the English setting: "using endings that indicate gender and number." English does have plural endings on nouns indicating number; however, the difference in Spanish is that adjectives also have endings that indicate gender and number and must be in agreement with the noun they describe. Also, Spanish adjectives when made plural can be pronouns, something that is atypical or considered slang in English. For example, one can say in reference to a bag of marbles, show me "los azules." Literally this translates as "the blues;" whereas, an English teacher in the United States might correct the student to say "the blue ones" instead.

### *writing*

Of the content standards and objectives listed under "written language" in Mexico, there are only three that do not overlap with the U.S. ones. First, children in Mexico are expected to "compare words according to their number of letters and their first letter." Comparison by first letter is explicit in the U.S. standards but not comparison by number of letters. Second, "comparing words in order to discover/understand conventional representation of letters" is not explicit in the U.S. standards. Recall from Table 4, however, that there are a number of objectives listed under "demonstrate knowledge of concepts of print" that reflect the same purpose. Third, "locating known words in text" is not explicit in the U.S. standards.

A punctuation difference that could surface in the classroom involves the distinction in Spanish-speaking countries between two types of periods, or, more precisely, expressions used to denote two types of periods. The Mexican standards require that children understand the difference between the *punto final* and *punto y aparte*. Both expressions indicate that the punctuation of a period is required. However, the *punto final* indicates that no more information follows; whereas, the *punto y aparte* indicates a change in idea or topic and, therefore, that a new paragraph should follow.

The most significant difference regarding "writing" involves the distinction between writing in block letters and cursive letters (i.e., printing v. writing). The Mexican standards specify that first graders should be able to write "all the letters of the alphabet in both print and cursive (or script) styles." The Texas standards specify that students "may begin to use cursive writing" in third grade. The California standards' state that first graders should "print legibly" but in subsequent grades the term "handwriting" is used in a generic fashion. In other words, there is no state recommendation in California as to when schools should introduce elementary grade students to

cursive writing. While there tends to be a lot of local variation then, most schools introduce cursive writing in third grade, as in Texas. However, in California, many school districts have adopted the D'Nealian writing system in which printed letters are formed more like their cursive counterparts in order to facilitate the transition from printing. A reading specialist in the California Department of Education reports that given the theoretical ease in transition in this system, students in many school districts in California are introduced to cursive writing in the middle of second grade—somewhat earlier than is customary (D. Lott, personal communication, September 8,52000).

*Second Grade*

*Listening and Speaking*

As in first grade, the content standards and objectives in Grade 2 overlap significantly. In listening and speaking, there is an emphasis in both countries on a variety of skills including giving descriptions, telling stories, asking questions, and making presentations in front of a group. There are, however, certain other skills that are raised in the U.S. objectives that do not explicitly appear in the Mexican ones, including summarizing, paraphrasing, clarifying, interpreting, and evaluating. (Note that these skills are often explicit in reading and writing objectives as well.)

Similarly, there are objectives in the Mexican standards that do not appear in the U.S. ones. First, there seems to be an emphasis on expressing and exchanging opinions in the Mexican standards that is not the case in the United States. This was true not only in first grade, where students are expected to express opinions, but also in the second grade, where students are expected to "exchange opinions in small groups about the context of texts and other materials." In fact, explicit mention of "opinion" is not made until the third grade in the U.S. standards and then it is *a* matter of "distinguishing between opinion and fact." Second, Mexican second graders are expected to engage in discussions in order to "form consensus on common points of interest." Forming consensus is another skill that is absent from the U.S. standards and objectives.

*Reading*

In reading, there are several standards and objectives that are included or emphasized in Mexico but not in the United States. First, students in the United States are expected from first grade to be able to describe how

illustrations contribute to the text. One can divine that one of these contributions is aiding in understanding what the story is about. In fact, many schools in both California and Texas follow the "reading process," the third step of which is to "plan and predict" by studying the illustrations and graphics, among other things. This, however, is not explicit in the U.S. standards and objectives but is in the Mexican ones (as per "Deduction of the theme of a story or text by observing the illustrations"). Second, the U.S. standards do not include mention of "understanding the meaning of and using traditional refrains, phrases, and sayings." Third, the Mexican standards require that students read to each other and exchange materials that they have written so that their classmate(s) can illustrate them. Fourth, U.S. second graders are required to participate in rhymes but not to create them, an explicit requirement in Mexico.

Similarly, there are several inclusions or areas of emphasis in the U.S. standards and objectives that do not appear or are not emphasized in the Mexican ones. First, there is much more emphasis in the Texas standards (but not the California standards) on using writing as a research tool. For example, second-grade students are expected to take notes from a variety of sources and be able to compile them into reports. Nevertheless, Mexican teachers are encouraged to have their students "form teams to get more information on a topic they have read about," and that they should use "the classroom library, other classmates, or their teacher" as resources. They should then be able to organize this information and report it to their classmates (1998, September, p. 13). Second, there is much more emphasis in the U.S. standards and objectives on distinguishing different forms and styles of text explicitly including narrative, expository, fact, fantasy, stories, and poems. Third, there is also an emphasis in the United States on understanding and analyzing specific characteristics of stories, including plot, setting, and characters.

It should be pointed out that even though it is not explicitly mentioned in either set of standards, elements of the "reading process" surface in both countries. These elements include establishing the purpose for reading, activating prior knowledge, and making predictions, among others. These elements are specified in the U.S. standards and objectives but not reflected

in the Mexican standards. They are, instead, included in the teacher's manual as are descriptions of specific approaches to reading (SEP, 1998, p. 12). (See note 1, p. 69 for a description of the different approaches to reading.)

*Writing*

In writing, there is a significant similarity in the focus of both countries on following the writing process. The U.S. standards and objectives explicitly endorse the writing process: prewriting, drafting, revising, editing, and publishing. Teachers in Mexico are encouraged to use these same elements in writing workshops. The second grade teacher's manual encourages teachers to follow three stages of writing, the elements of which mirror the U.S. "writing process." In the first stage (a la prewriting), students determine the purpose and audience for their writing, select the topic and the type of text they want to write, and outline. In the second stage (a la drafting), they write a draft and revise it collectively (i.e., with peers). In drafting, students attend to certain aspects of their writing: clarity of ideas, language use, sequence, and structure. In revising, they attend to paragraphing, spelling, and punctuation. On they final draft, they attend to legibility and neatness. In the third stage (a la publishing), students decide how best to publish their work, e.g., as a mural, an album, book, etc. (1998, September, p. 14).

In addition to this significant similarity, there are also several important differences. The first difference involves the writing/reading activity of generating alternative endings to stories. This activity, specifically "'generating alternative endings to plots and identifying the reason or reasons for, and the impact of, the alternatives, is introduced in California in second grade (and is not explicit anywhere in Texas objectives), but it is introduced in first grade in Mexico. The second difference is that the activity of changing the dialogues of short stories to create different stories appears in the Mexican but not in the U.S. standards and objectives. Finally, grouping, sorting, or classifjmg words is an objective in the second grade in Mexico but is not mentioned until the third grade in the United States.

*Third Grade*

*Listening and Speaking*

Generally, "listening" seems to be emphasized more in the United States. Objectives that are explicit in the California and Texas standards, such as "determining the purposes for listening' or "listen critically to interpret and evaluate," do not appear in the Mexican standards. This is true throughout

the three grade levels. One aspect of listening (and reading) that is explicit in the Mexican standards is "recognizing indigenous words." Interestingly, this is the explicit reference to Mexico's indigenous peoples that appears in the standards and objectives. In fact, as pointed out earlier, culture is not mentioned at all.

*Reading*

There are certain specific objectives in the U.S. standards that do not appear in the Mexican ones. Mainly these relate to analyzing the characteristics of types of texts and recognizing their distinguishing features. For example, distinguishing fiction from nonfiction and fact from fantasy is an explicit objective in the U.S. but not the Mexican standards. While these objectives are not explicit in the standards, they are implicit in some exercises in the Mexican text. In this vein, the Mexican textbook provides definitions of certain genres. For example, having read a fable and a copla, students are expected to answer questions about the content but not the characteristics of the genre, which are instead given in the definition (1997, September, pp. 26 and 114). Just as this analysis of literary forms tends not to be emphasized, neither is the analysis of their parts: characters, plots, settings, etc.

Another difference involves the inclusion in the U.S. standards of using reading as a research tool. Students are expected to identify or generate relevant questions for further inquiry after or while reading. They are also expected to compile information and to draw conclusions from it. Beyond requiring students to "search for information in reference books," the Mexican standards make no mention to "research."

*Writing*

One of the similarities in the third-grade standards and objectives is the continued focus on spelling. Of course, the language differences make comparison here unnecessary. However, it may be useful for teachers in bilingual programs dealing with Spanish language arts to consider the general sequences of topics, including spelling, followed in the Mexican content standards and objectives.

As was the case with reading, another significant difference is the U.S. emphasis on using writing as a research tool. This includes objectives such as "compiling notes into outlines, reports, summaries . . .," "taking simple

notes from relevant sources...," and "writing or dictating questions for investigation." It should be pointed out that this emphasis is explicit in the Texas standards but not the California ones. The latter standard in this area is much less specific: "Understand the structure and organization of various reference materials, e.g., dictionary, thesaurus, atlas, and encyclopedia." This California "research" standard is similar to the Mexican standard in this area.

A final difference is the emphasis in Texas (but not California) *on* the standard of evaluating one's own and others' writing. The Mexican standards include reading the writing of others but do not mention any sort of evaluation. Since Mexico, as the United States, follows the writing process, it is implicit that students evaluate their own writing. It may or may not be the case that students apply the writing process to each other's writing. Although, given the Mexican emphasis *on* group work, it would be defensible to conclude that they do.

*Summary and General Observations*

The content standards and objectives are far more specific in the United States than in Mexico. Indeed, the number of specific objectives is *at least* three time greater in the U.S. standards. However, this quantitative difference is explained in part by the choice in the U.S. standards to be quite specific, e.g., pointing the need for instruction of "blends" or "clearly producing beginning, medial, and final sounds." The U.S. standards and objectives also seem to be redundant quite often. For example, there seems to be *no* difference between "decoding by using all letter-sound correspondences within a word" and "decoding by using all letter-sound correspondences within regularly spelled words," even though these *are* objectives are listed separately. Stepping back from the specificity in the U.S. standards and the lack thereof in the Mexican standards, it is clear that both countries emphasize the *standards* standards more broadly speaking. For example, both countries emphasize speaking, reading, and writing about a variety of topics for a wide variety of purposes considering a wide variety of audiences. Similarly, the *at least* countries invoke elements of both the reading and writing processes.

# IV



## SUMMARY AND CONCLUSIONS

The standards-based reform movement has swept through the United States over the past decade. Standards in every core subject area have been developed, usually by national organizations, and adopted in nearly every state. Part I of this monograph reviewed the mathematics and reading/language arts content standards and objectives as they presently exist in Texas and California. The standards in these two states overlap greatly, evidence of the impact of the movement nationally. While the depth of the impact of this movement on teachers in actual classrooms varies (cf. Haug, 1998) and the ability of such standards alone to create the desired impact is questionable (cf. Massell, 1998), there can be no question that this movement has had some impact.

Nevertheless, it is not enough to have an understanding of where we want children to end up academically. We must also understand where they have come from and where they are academically. This monograph is a step in that direction. Indeed, in its focus on a subgroup of students, Mexican immigrant students, it is a very specific step. In this vein, Part II of the monograph briefly presented the nature of school governance and curriculum development in Mexico and a more detailed presentation of content standards and objectives in mathematics and reading/language arts. This is not to say that recent educational reforms in Mexico are equivalently "standards based." They are, however, similar in their attempt to specify content, topics, and objectives. It is hoped that this information will provide U.S. school personnel with a source for some guidance in the education of their Mexican immigrant students.

Further to this objective, a preliminary comparison of the content standards and objectives was offered. The basic conclusion was that the Mexican U.S. standards (the latter as represented by Texas and California) touch on most of the same skills and objectives; however, a number of specific differences were also pointed out. In addition to the information provided in Part III, there are a couple of other general conclusions that can be drawn. First,

anecdotal (cf. Garza & Rodriguez, 1999) claims have been made purporting more advanced curricula in Mexico, mostly in math and science. Given the information provided in this monograph, this claim cannot be substantiated. (Note that this should not be interpreted as a claim that the opposite is true.) Second, it has also been posited that the math curriculum in the United States is "a mile wide and an inch deep" (Schmidt, McKnight, & Raizen, 1997a).

Based on this look at the content standards, this statement seems an exaggeration. This is an important point, however, and the author would be remiss not to point out that Schmidt et al. (1997b) found substantial differences in the number of topics covered in the mathematics curriculum in Mexico and the United States. In first grade, the United States presents approximately twelve topics in comparison to only seven in Mexico. In the second and third grades, seventeen and twenty-one topics, respectively, are presented in the United States as opposed to only eight and twelve, respectively, in Mexico.

Whether or not this is also specific to California and Texas is not known. Nor can we be sure that it is still true given the curricular changes in both California and Texas that have occurred since Schmidt et al. performed their analysis.

However, we must also consider that, in addition to introducing a greater number of topics, U.S. standards also tend to require that less time be dedicated to mathematics instruction than in Mexico. As was pointed out at the beginning of Part II, Mexican reform included an increase in the number of school days and instructional time in specific content areas. As a result of this change the Mexican standards require, in the first and second grades, approximately 30% more time be dedicated to mathematics than in the United States, and approximately 10% more in third grade. (On the other hand, the U.S. standards require 25% more reading/language arts instruction in first and second grades and nearly 50% more in third grade.)[1]

This discussion, of course, raises a number of issues, one of which is the difference between the officially required instructional time and the quality and quantity of *actual* instructional time in the classroom. For example, how much freedom do teachers have in curriculum choices? Classroom research is required to determine the extent of the difference between official and actual time dedicated to specific subjects. The quality of that instructional

[1] This is based on the 180-day school year in the United States versus a 200-day school year in Mexico. Texas has removed all references to instructional time in its standards and, therefore, these figures are based on the California standards, which require 50-60 minutes of mathematics instruction per day and two and half hours of "uninterrupted language arts instructional time daily."

time also requires further research to look at both the teaching methods being used and their effectiveness. Instructional methodology is naturally a part of any well-conceived notion of curriculum. As Tanner and Tanner (1995) argue, to ascribe to knowledge "an existence independent of the ways and means through which [it] is developed and through which people become knowledgeable, is like separating the act of swimming from water" (p. 180).

Instructional methodology, therefore, should be a topic of any future research in this area. It has been reported, for example, that "most schools in Mexico rely on teacher-directed instruction [as opposed to group work and student-directed instruction]" due to "the number of students in the classroom, lack of teaching materials (such as manipulatives for hands-on activities), and schedules that require teachers to roam from room to room" (Garza & Rodriguez, 1999, p. 11). Similarly, Macias (1990) observed that teaching methods in Mexico were characterized by "a great reliance upon explicit teacher presentations (and the textbooks and teacher guides provided by the Secretaría de Educación Pública). But contrary to Garza and Rodriguez (1999), Macias also reported "a high level of student oral and behavioral interaction, the use of perceptual, tactile activities to facilitate learning" and a "loud group orientation" in which "silent seat work is rare." Clearly, we do not have an accurate picture of methods in Mexico and neither of these studies is generalizable. Given this, we also cannot have a clear understanding of the discordance that immigrant children will experience vis-à-vis the methods they grew accustomed to in Mexico and the approaches that teachers in the United States might employ.[2]

We also need to know much more about teachers and the teaching profession. What kind and how much professional development have teachers received in order to implement the various content standards and objectives? What are teachers' beliefs about and attitudes toward their profession, methodological and programmatic strategies, and other areas? Indeed, a preliminary study of these questions indicates that teachers from different backgrounds hold significantly different opinions on various aspects of the teaching profession (Garcia & Gonzalez, 2000). Such differences may have a differential effect on students.

Of course, there is the larger question here of whether or not, given individual teacher variation, we can generalize pedagogy anyway. I think we can to a certain degree.

In sum, the three most important areas of future research-given the primary purpose of this monograph—are a more in-depth analysis of curricula, a qualitative analysis of teaching methods, and an analysis of teacher preparation and attitudes. Curricular analysis must consider things such as the grade a given topic is introduced (within a specific subject), the duration of the coverage of that topic within and across grades, and the number of topics covered at each grade. We must also consider that the content standards and objectives here may or may not reflect the actual delivery of the curriculum.

Beyond this, other areas of future research could include issues of equity. How does the curriculum address different achievement levels among groups (e.g., as identified by race, ethnicity, language background, gender, etc.)? In terms of the education of Mexican immigrant students in the United States, what other issues must we consider if that immigrant student happens to have been from a language or ethnic minority group in Mexico, for example?

Finally, related to the previous issue, we must also consider issues of assessment. How are children in Mexico assessed differently than children in the United States? How well do the different assessment procedures and instruments reflect the curriculum and standards?

Clearly, this monograph has only scratched the surface of a myriad of important issues. Hopefully, it will serve as a catalyst for exploration of them and more specific consideration by U.S. educators of the backgrounds and educational experiences that their immigrant children bring with them, and by Mexican educators of the educational experiences that children returning to Mexico bring back with them.

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## About CBER

The Center for Bilingual Education and Research (CBER) is part of the College of Education, Arizona State University. CBER was founded in 1980. It is one of several university units that promote scholarship and discourse on issues and opportunities related to language, race, and ethnicity. During its early history, CBER served aminly as a technical assistance unit providing training and assistance to schools in the Southwest. In 1998, CBER shifted its focus and is now concerned with policy analysis and scholarship in bilingual and dual-language education.

We will collaborate with others who share our interest in contextualizing bilingual and dual-language education in a broader framework of needs involving school restructuring and modernization to better serve **all** children. CBER's vision is to inform bi-national pedagogy uniquely suited to education in the borderlands.

## About IDRA

Intercultural Development Research Association is a vanguard leadership development and research team working **with** people to create self-renewing schools that value and empower *all* children, families and communities. It is an independent, non-profit organization that advocates the right of every child to a quality education. For more than 25 years, IDRA has worked for excellence and equity in education in Texas and across the United States. IDRA conducts research and development activities; creates, implements and administers innovative education programs; provides teach, administrator, and parent training and technical assistance; and develops leadership in communities to result in enlightened educational policies that work for *all* children.

## About Mexican and American Solidarity Foundation (Fundación Solidaridad México Americana)

The Mexican and American Solidarity Foundation was created to encourage closer ties between Mexicans and the Mexican American and Hispanic community in the United States, as well as to foster collaboration and improve relations between the United States and Mexico. It is a binational, private, non-profit, nonpartisan organization.

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