

## Introduction

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On behalf of the Asia-Pacific Economic Cooperation (APEC) and the United States Department of Education, Achieve conducted an analysis of the mathematics and science standards for students in 12 of APEC's 21 member economies.<sup>1</sup> Standards are the primary policy tool for defining expectations for what students must learn and teachers must teach. Standards provide a framework for the development and use of textbooks and other instructional materials, assessments and teacher preparation. The goal of this analysis was to determine similarities and differences among the member economies' expectations and priorities in three main areas:

**(A) Qualitative aspects of standards.** Achieve reviewed the organization of economies' standards with respect to the organization of the standards into single grade levels or multiple-grade bands. Achieve also documented how the member economies organize their mathematics and science content standards in regard to key strands and broad topics. Finally, Achieve observed the level of detail of the standards from each economy.

**(B) Common content expectations.** The primary goal of this analysis was to identify and describe expectations for what students should know and be able to do that are common across the participating economies, and to determine the extent to which these common expectations reflect a substantial portion of the standards developed by each economy. Common expectations provide a benchmark that economies can use to review their own standards. Where an economy's standards depart from this international benchmark, for example, that economy may wish to consider whether changes are indicated. At the same time, economies may also want to pay attention to instances in which only one or two economies value a particular set of knowledge or skills. In some cases, these outliers may be signaling skills that will take on increased importance in the global economy. We suspect, for example, that New Zealand's relatively greater emphasis on probability and statistics in its mathematics standards may be an example of this.

**(C) Performance expectations.** Achieve also considered the levels of performance skills evident in the member economies' standards. In mathematics, analysts identified procedural skills, conceptual understanding skills, and strategic problem solving and reasoning skills; in science, they differentiated between inquiry skills and knowledge skills.

Educational standards are not the only factor affecting teachers' instructional decisions and priorities. While some economies may employ standards as a detailed and binding map of the curriculum, others use a variety of other tools and strategies such as curriculum guides, textbooks and professional development sessions to define and communicate expectations for students. Furthermore, the assessments to which students, teachers and schools are held accountable influence the prioritization of certain topics. These factors all shape the actual expectations that teachers hold for students and the actions they take to support student achievement. Therefore,

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<sup>1</sup> For more information about APEC and the standards analyzed in this report, visit [http://hrd.apecwiki.org/index.php/Main\\_Page](http://hrd.apecwiki.org/index.php/Main_Page).

this analysis, focused exclusively on standards, necessarily provides an incomplete picture of the similarities and differences in curricular expectations for students.

Given the different educational, economic and cultural contexts in each economy, there is little reason to expect uniformity in the content or organization of curriculum standards. At the same time, in a global economy where the availability of skilled workers increasingly determines where jobs are located, it is in each economy's interest to set internationally competitive standards. Taken together, these analyses will begin to provide a new basis on which each economy can examine the adequacy and appropriateness of its own standards.