From a Strong Foundation to a Stronger Future

Updating Massachusetts Learning Standards

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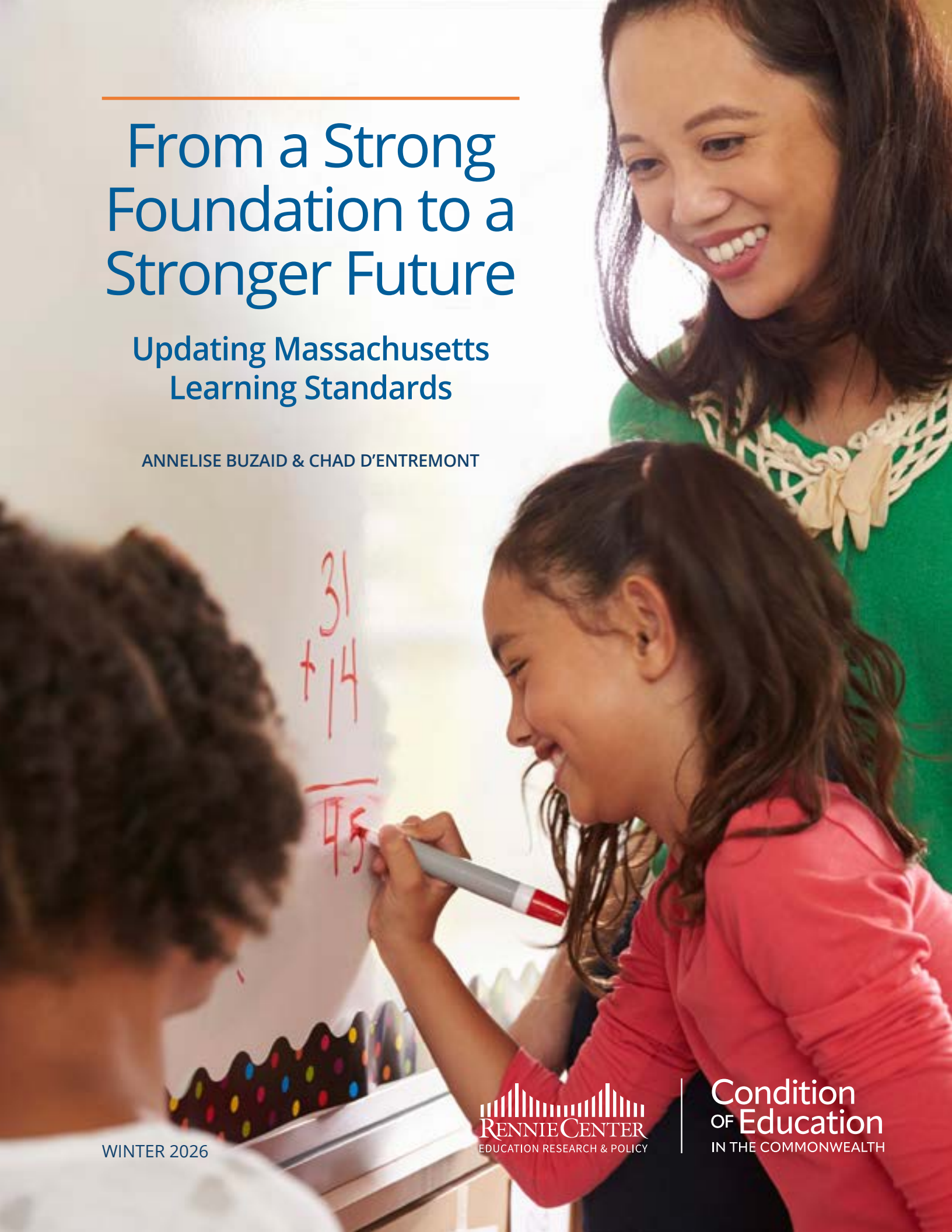

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Condition OF Education
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Introduction

When Massachusetts enacted the Education Reform Act of 1993, it marked one of the nation's most ambitious efforts to align public schooling with a rapidly changing economic and social landscape. State leaders were responding to the rise of what was then called the knowledge economy, an era that placed a growing premium on information and expertise. The law's new standards and accountability measures reflected that shift. By ensuring that all students met a common, rigorous foundation of academic knowledge and skills, policymakers aimed to extend meaningful educational opportunities and give every young person a real chance to participate in an increasingly interconnected and technology-driven world.

Three decades later, however, the world those standards were built for no longer exists. The economy continues to evolve, and technological change has only accelerated. Information is abundant, and machines now gather, analyze, and even generate it in an instant. The skills that once defined success are no longer sufficient. Although a strong foundation of academic rigor remains critical for every Massachusetts student, it must now serve as the launchpad for a new generation of learning goals. What distinguishes human contribution today is the capacity to interpret, create, collaborate, and apply knowledge with imagination and ethical judgment.

Yet our education system still rests on a paradigm of frontloading knowledge early in life, assuming that what students learn in their first two decades will sustain them across their careers. In today's world, that assumption no longer holds. The pace of technological and social change means students will need the skills to continually acquire new knowledge and competencies as they navigate shifting professional paths. Schools must therefore do more than prepare students for a single future: they must equip them to learn, unlearn, and relearn throughout their lives. The foundation of K–12 education must be lifelong learning itself—curiosity, adaptability, and the confidence to grow amid uncertainty.

This transformation demands more than incremental adjustment; it calls for reimagining the very backbone of the education system—our standards. Standards shape what students learn, how they are assessed, and which forms of thinking are prioritized in classrooms. Too often, Massachusetts' current frameworks emphasize algorithmic thinking and procedural skills that AI can now replicate with ease, while the deeper human intelligences students will need to thrive remain secondary. Take the math frameworks, for instance. Although they call for mathematical modeling and real-world problem solving,

> Massachusetts has long been recognized as the nation's leader in K–12 academic achievement. Today, that standing is at risk. Post-pandemic data show that the Commonwealth is recovering more slowly than many other states, with widening gaps in student achievement. Without renewed focus on mastery of core academic skills—paired with learning goals aligned to today's economy—Massachusetts risks losing the academic edge that has defined its leadership for decades.

the sheer breadth of grade-level expectations makes these goals nearly impossible to realize. Curricula designed to cover every standard push teachers to rush through material, reducing applied skills like modeling to contrived word problems with predetermined answers. Students may calculate when trains leaving different stations will meet, but authentic modeling demands open-ended inquiry and time to identify variables, test assumptions, and interpret results in context. It also requires practice with questions that matter to students, such as comparing public transportation options, analyzing community data, or optimizing city budgets. When pacing pressures crowd out this depth, students lose the chance to experience mathematics as a living discipline that helps them make sense of the world. This pattern of superficial coverage appears across all subjects, where exposure and recitation of facts and procedures too often overshadow true learning.

To prepare students for the world that awaits them, standards must remain academically rigorous, but evolve from rigid grade-level measures to mastery-based progressions anchored in durable, human-centered competencies such as adaptability, critical thinking, collaboration, and self-directed learning. Students must graduate with:

- **Strong academic foundations:** literacy, numeracy, and scientific reasoning remain essential, serving as gateways to all future learning
- **Learning ability:** the capacity to upskill and reskill throughout life
- **Uniquely human skills:** creativity, critical thinking, emotional intelligence, cultural understanding, problem solving, and collaboration

This report recommends three shifts to the Massachusetts standards to ensure that every student graduates with both the academic foundations and the human capacities needed to adapt, reskill, and thrive. It begins with a call to identify and prioritize "power standards," the essential academic foundations required to access complex content. Next, it proposes a shift from grade-specific standards to mastery-based progressions. The third section centers on refocusing standards to emphasize durable skills. The report concludes with considerations for implementation in Massachusetts.

CORE TENETS OF **LEARNING SCIENCE**

The three shifts to Massachusetts standards outlined in this report are meant to help schools redesign instruction based on research about how students learn. This idea was explored in depth in the Rennie Center's 2024 report, *The Schools Our Students Deserve*, which highlighted four core tenets of learning science:

- **Prioritize** core academic skills and deep learning over breadth of content
- **Personalize** instruction to meet each student's developmental needs
- **Practice** knowledge and skills repeatedly, with feedback, to achieve mastery
- **Pursue** applied learning that is relevant and aligned with students' interests

SHIFT 1

Identify and prioritize the most essential "power standards" that anchor future learning

Even as Massachusetts redefines priorities to include durable skills, strong academic foundations remain essential. Literacy, numeracy, and scientific reasoning give students the tools to engage in higher-order thinking and problem-solving. Yet Massachusetts' current standards span thousands of discrete expectations, often leaving teachers racing to cover content rather than ensuring deep learning. This approach leaves little time for sustained analysis, practice, or reflection—the conditions under which learning sticks.

For example, the Massachusetts History/Social Science Framework incorporates inquiry questions to frame each unit. The intention is that students studying a topic like the American Revolution engage in rigorous economic, political, and social analysis to understand the complexities behind the colonists' decision to rebel against Great Britain and the choices that shaped the founding of a new nation. What happens in practice is very different. With teachers facing pacing pressure and limited training on inquiry-based instruction, many students read textbook chapters summarizing key events, fill out timelines, and memorize dates for a test. Research shows that students who are already navigating systemic barriers related to race, language, disability, and income are most likely to experience a form of instruction that privileges procedural recall over deep understanding (Washington State Board of Education, 2018).

Refocusing on a smaller set of power standards will reduce the amount of content teachers must cover each year and create space for cross-disciplinary learning that builds durable skills. This learning should help students apply their

academic foundations in real contexts by using reading, writing, mathematics, and scientific reasoning to analyze, design, and solve authentic problems. Ultimately, this shift allows students to grapple with essential ideas and concepts long enough to understand them deeply and use them across disciplines.

Significant groundwork already exists for identifying power standards. Education researcher Larry Ainsworth established widely recognized criteria for determining which standards matter most. According to Ainsworth, power standards are those that demonstrate:

- **Endurance:** skills and knowledge that students will need for life beyond a single test or grade level
- **Leverage:** concepts that apply across multiple disciplines or contexts
- **Readiness:** the essential prerequisites for success at the next level of learning, from one grade to the next or into college, career, and civic life

These criteria are visible across core disciplines, and many of the most essential standards exemplify endurance, leverage, and readiness simultaneously. In mathematics, deep understanding of fractions is foundational, supporting later learning in ratios, proportional reasoning, and algebra. In English language arts, early literacy skills—phonemic awareness, phonics, and decoding—lay the groundwork for accessing complex texts and, over time, enable growth in vocabulary, comprehension, and written expression.

During the COVID-19 school closures, when instructional time was severely constrained, many states and education organizations identified priority standards to help educators focus on essential learning. These efforts provide a strong starting point for Massachusetts, but they were developed under crisis conditions. Now, with the benefit of time, care, and attention to the needs of all communities, the Commonwealth can revisit this work to determine what truly matters for students' long-term success. This reexamination is especially urgent as artificial intelligence and automation continue to reshape the skills and knowledge students will need for future work and civic life. Some standards once considered "essential" are now easily automated or instantly retrievable, prompting the need for conversation about where sustained instructional time should be directed.

SHIFT 2

Move from Fixed Grade-Level Frameworks to Mastery-Based Progressions

Massachusetts' current curriculum frameworks assume that learning unfolds uniformly by age and grade. In reality, research from neuroscience and developmental psychology shows that variability is the norm, not the exception. Studies of brain maturation demonstrate that core capacities such as working memory, attention, and executive function develop along wide and individualized timelines, meaning that students of the same age may be at different stages of readiness for particular kinds of learning. Teachers see this every day in their classrooms: a nine-year-old student may be ready for accelerated work in mathematics while still struggling with reading comprehension. Educators work hard to accommodate these differences through small-group instruction, technology-based platforms, and tutoring, but these are interventions made in spite of, not because of, the system. The current grade-level system was not designed to support this level of learner variability, and as a result, even strong instructional practices operate within constraints

that limit their effectiveness. To address this disconnect, Massachusetts will need a more flexible structure for organizing learning, one that aligns with developmental readiness but also preserves the guardrails necessary to ensure consistent progress for all students.

Reorganizing the School Day

Making a shift to mastery-based progressions would certainly be a significant undertaking. For years, education leaders have urged movement toward mastery-based learning or competency-based education, yet these efforts have faltered within a system designed to advance students strictly by age. Even so, developmentally grounded learning is already woven into many aspects of schooling. Montessori programs, long recognized as exemplary models for early learning, operate successfully in public settings and rely on multi-age groupings anchored in developmental progress rather than seat time. At the other end of the continuum, it is common for high school students of different ages to learn side by side in courses aligned to their level of progression or the point at which they first enrolled in a new discipline, such as a world language. And in sectors less constrained by traditional grade structures, particularly early childhood education and higher education, organizing learning around developmental readiness is the norm.

A **mastery-based progression** organizes learning around students' readiness and demonstrated understanding rather than seat time. Students move forward when they show evidence of mastering essential skills and concepts—not simply because a year has passed. This approach reflects learning science, which shows that deep understanding develops through iterative practice, targeted instruction, and timely feedback. By aligning learning to each student's developmental readiness, well-designed mastery-based systems support lasting learning.

Many schools have begun to build on these strategies and demonstrate that a different approach is possible. In Essex County, one elementary school has organized early literacy intervention for all first- and second-grade students at the same time each day. By aligning schedules, the school can deploy every grade 1 and 2 educator—including general education teachers, special education teachers, and interventionists—to work with small groups. Students are flexibly grouped across grade levels based on their specific literacy needs at that moment, allowing teachers to provide highly targeted instruction. This approach ensures that each student receives the right level of support or challenge, reflecting the core idea of mastery learning: meeting students where they are.

Beyond Massachusetts, Lindsay Unified School District in California has replaced traditional grade levels with a performance-based system in which students advance upon demonstrated mastery rather than time spent in class. In this model, students learn alongside peers of different ages, while teachers use real-time data dashboards to monitor progress, regroup learners, and provide targeted interventions or enrichment so no student moves forward with gaps or remains stuck on material already mastered. Alpha School, a growing network of private K–12 schools that centers artificial intelligence as the engine of instruction, similarly rethinks conventional notions of classroom time. Students

typically spend just two hours per day on core academic subjects via AI-driven apps that continuously assess mastery and customize learning paths. The remaining time is devoted to developing life skills and deepening understanding through passion projects and hands-on workshops. Though two hours may seem short, active instructional time in many classrooms is already far less than schedules suggest. Nationally, third graders receive just under 74 minutes of math instruction per day (National Center for Education Statistics, 2020), but once the openers, announcements, transitions, and routines of most classrooms are accounted for, actual engaged learning time per subject likely amounts to far less time.

The challenge, then, is not the absence of viable models but the difficulty of systematizing them in a landscape still shaped by rigid grade-level standards and age-based progression. Overcoming this requires a systemwide rethinking of the standards themselves, developing mastery-based progressions that allow for meaningful flexibility and enable schools to honor the individual strengths and learning trajectories of each student.

How Massachusetts Can Make The Shift

Once Massachusetts has identified and prioritized power standards, it can reorganize those essential standards into coherent mastery-based progressions anchored by developmental milestones. Rather than maintaining thousands of discrete, grade-specific benchmarks, Massachusetts can use its refined set of power standards as the backbone for a more navigable, research-aligned system that reflects how learning actually unfolds.

A milestone-based framework recognizes that certain skills have research-anchored developmental windows, while others progress more flexibly. For example, studies consistently show that most children who are exposed to systematic literacy instruction can achieve fluent reading by around age eight (National Reading Panel, 2000; Snow, Burns, & Griffin, 1998), while foundational number sense and math fluency typically consolidate between ages seven and nine (Geary et al., 2013; Siegler & Lortie-Forgues, 2017). Later mathematical reasoning skills, such as proportional reasoning and algebraic thinking, tend to emerge between ages twelve and fifteen as executive function and abstract reasoning mature (Blair & Razza, 2007; National Mathematics Advisory Panel, 2008). These evidence-based milestones can serve as anchor points within a mastery-based system, indicating when the majority of students are developmentally ready to master a particular skill.

IMPLEMENTATION **CONSIDERATIONS**

It is important to note that significant shifts in standards, described here, will be ineffective without other necessary policy changes. For example, shifting standards to a grade band structure will not lead to change in school-based practice if MCAS testing is still administered based on specific grade levels. Instead, shifts to standards must be made in concert with shifts in how we approach student assessment and other policies, such as seat time requirements. These topics will be explored in depth in the second and third briefs in this series.

Each power standard would therefore cover several age or grade bands—such as grades K–2 or age 5-8—and outline the knowledge and skills that represent progress toward mastery. Within these progressions, clearly defined performance levels (emerging, developing, proficient, and advanced) would describe what mastery looks like at different stages and help teachers align instruction and assessment. In this model, milestones act as developmental waypoints, helping educators know when most learners are ready for key concepts (for example, basic number fluency or algebra readiness), while allowing flexibility for those who reach them earlier or later.

These milestones also guide the delivery of timely intervention. When a student is not showing steady progress across performance levels within the expected developmental window, it signals the need for more intensive support. For instance, in early literacy development, fluent decoding and comprehension are typically established by around age eight. However, teachers do not need to wait until that point to act. If a six-year-old is not demonstrating growth in phonemic awareness, letter–sound correspondence, or basic word reading—skills shown to predict later reading success (Foorman et al., 2016; Torgesen, 2002)—those early indicators flag the need for targeted reading intervention well before age eight. In this way, milestones provide both a roadmap for learning and an early-warning system that helps schools respond quickly and effectively when students fall off the standard trajectory.

The Massachusetts Arts Curriculum Framework already uses a banded structure, providing a model for expansion. In applying this approach to other disciplines, the state can build on existing tools such as the DESE Quick Reference Guides, the Massachusetts Standards Navigator, and national developmental models to map how learning unfolds across domains. Organized in this way, the standards would serve not as fixed grade-level checklists but as developmentally responsive pathways that show where students are, where they need to go next, and how to help them get there.

Prioritizing essential standards and organizing them by mastery creates time and flexibility for a deeper purpose: helping students build the durable skills that will carry them through life. The third shift focuses on making these skills the centerpiece of daily learning.

SHIFT 3

Elevate durable skills such as critical thinking, creativity, and problem solving

By focusing on a smaller set of power standards and organizing them into a mastery-based progression, Massachusetts can create the time and flexibility to make durable skill-building the centerpiece of a student's school day. When learning is intentionally designed around these skills, school becomes less about mastering facts and more about developing the ability to use knowledge flexibly and meaningfully.

In this vision of schooling, learning begins with real-world challenges rather than discrete subjects. Students take on authentic problems that require them to apply skills and concepts from multiple disciplines. For example, a middle school team might investigate local water quality as part of a three-week environmental research initiative. They collect and test water samples from nearby streams, analyze the data using mathematical and scientific methods, and explore the social and economic factors that influence environmental policy. The project culminates in a public presentation where students propose evidence-based solutions to local officials and community members. Through this process, students practice data analysis, systems thinking, and civic engagement while addressing an issue with tangible relevance to their community. Teachers act as coaches, guiding students through cycles of inquiry, experimentation, and reflection. This approach builds the durable competencies students will need in their future careers including critical thinking, adaptability, collaboration, and creative problem-solving.

The culture of learning also shifts in these environments. In many schools today, students are rewarded for following directions and finding the correct answer as quickly as possible. As a result, students become adept at avoiding mistakes rather than engaging deeply with complex ideas. In contrast, classrooms that prioritize durable skills create conditions for experimentation, feedback, and iteration. Students take intellectual risks, work collaboratively, and persist through ambiguity. This kind of learning prepares students to participate fully in civic, social, and economic life, where they will need to contribute ideas and think creatively to solve new and complex problems.

What it Takes to Elevate Durable Skills in K–12 Curriculum Frameworks

Massachusetts does not need to start from scratch to create standards that emphasize durable skills. The foundation already exists within the state's own frameworks, such as in the Standards for Mathematical Practice (SMPs), the Science and Engineering Practices (SEPs) embedded in the Next Generation Science Standards (NGSS), and the History and Social Science Framework's 8th Grade Civics Project requirement. The challenge is not invention but prioritization: making these durable-skill dimensions more visible, consistently applied across disciplines, and central to how standards are implemented and assessed in Massachusetts classrooms.

STANDARDS FOR MATHEMATICAL PRACTICE
EXAMPLES
MP1: Make sense of problems and persevere in solving them
MP3: Construct viable arguments and critique the reasoning of others
MP5: Use appropriate tools strategically

SCIENCE AND ENGINEERING PRACTICES
EXAMPLES
3. Planning and carrying out investigations
6. Constructing explanations (for science) and designing solutions (for engineering)
8. Obtaining, evaluating, and communicating information

The SMPs and SEPs already embody many of the competencies Massachusetts hopes to elevate, including critical thinking, reasoning, modeling, collaboration, and persistence. Yet they are currently treated as discipline-specific: SMPs belong to mathematics; SEPs to science. This separation reflects a legacy system of schooling organized around discrete subjects and siloed accountability structures. The developers of both frameworks designed them within that reality, assuming that instruction would continue to occur in those subject-specific "buckets." But the skills they describe are not bound to any single domain. They represent universal forms of thinking and problem-solving that all students need, regardless of subject or career path.

Massachusetts already demonstrates how these skills can live beyond disciplinary silos. The 8th Grade Civics Project in the state's History and Social Science Framework is a model of applied, cross-disciplinary learning. Students research a civic issue, analyze data, engage community partners, and present evidence-based recommendations. In many schools, students use data analysis from mathematics, persuasive writing from English language arts, and research methods from social studies to complete the project. This type of task not only deepens civic understanding but also fosters the same durable skills that underpin success across all domains.

Massachusetts can build on this model by liberating durable practices from their subject silos and positioning them as cross-cutting competencies that define high-quality learning.

For example, the mathematical practices—making sense of problems, constructing arguments, and modeling with mathematics—mirror the cognitive habits students use in the humanities when they interpret sources, evaluate evidence, and represent complex systems. Similarly, the science and engineering practices—asking questions, developing models, analyzing data, and designing solutions—map closely onto inquiry in social studies, creative production in the arts, and research and composition in English language arts.

SPOTLIGHT: **Rennie Center's Student Changemakers Curriculum**

The Rennie Center's Student Changemakers curriculum offers a Massachusetts-based example of what durable skill development looks like in practice. The customizable, 20–week curriculum is designed to help middle and high school students identify issues in their communities, conduct research, analyze data, and propose actionable solutions. The program helps learners develop skills in research methods and data analysis through a real civic change process. Along the way, students practice collaboration, critical thinking, communication, and problem-solving—durable competencies essential for success beyond school.

By making these practices shared learning expectations, Massachusetts can bring greater coherence and depth to its Frameworks. Instead of each discipline developing its own set of "practices," the state can establish a unified framework of durable competencies. Subject-area power standards would then describe how those competencies manifest within each domain. A system organized this way would also reduce the sheer volume of content teachers are expected to cover and allow for a more focused emphasis on what students genuinely need to learn, understand, and practice.

WHAT MIGHT IMPLEMENTATION LOOK LIKE IN A SCHOOL?

Middle and high schools currently experimenting with inquiry-based, interdisciplinary learning offer promising models for the organization of instructional time. One model involves dividing learning into two types of courses:

- Interdisciplinary studios: These inquiry-based courses are grounded in real-world challenges like climate change or economic inequality. Depending on content, they generally offer credit across multiple domains, such as .5 credits in biology, .25 credits in ELA, and .25 credits in math.
- Skills: These subject-specific classes generally focus on ELA and math, teaching critical, domain-specific skills.

It is important to note that the overall model may look different across age bands. Younger students may need more time for skills instruction, while order learners benefit from greater emphasis on interdisciplinary studios that support career exploration and postsecondary preparedness.

Implementation: Challenges and Opportunities

Updating the standards marks a crucial first step toward modernizing what and how students learn. Yet the true test lies ahead: translating those updated standards into daily practice across more than 300 diverse school districts, each with its own size, resources, and local priorities. Ensuring that durable skills take root in every classroom will require coherent, practical systemwide supports that help educators bring the vision to life. The steps outlined below describe how the Commonwealth can move from revised standards to consistent, high-quality implementation at scale.

- **Revise the standards in alignment with the three shifts referenced above.** Developing new curriculum frameworks will require a cross-disciplinary team of content experts and experienced practitioners working collaboratively to ensure coherence across subjects. This team should create an integrated set of practice standards, identify content-specific power standards, and map clear connections between the two. In addition, the team should define research-based milestones for each core skill so that learning progressions are grounded in learning science and reflect a clear trajectory of skill development.
- **Provide High-Quality Instructional Materials (HQIM) aligned to revised standards.** As the use of HQIM has expanded across Massachusetts, the Commonwealth cannot afford to move backward in this area. To sustain this progress, it will be essential to ensure that districts have access to high-quality curriculum options that align with the revised standards from day one. Bringing this vision to life will require close collaboration between the state, districts, and publishers to ensure that materials integrate disciplinary content with inquiry, design, and collaboration, rather than simply layering new activities onto existing units.
- **Translate existing models into school design exemplars.** To make it feasible for schools to implement the new standards, the state should draw lessons from existing models that already demonstrate how durable-skill learning can thrive within a standards-based system. Examples such as the Salem Public Schools' Rethinking Middle School initiative, Francis W. Parker Charter Essential School, the Watershed School in Boulder, Colorado, and NuVu School in Cambridge offer valuable insights into how schools can organize themselves to support deeper, interdisciplinary learning. These models can inform how districts deploy staff, structure class schedules, and allocate time for cross-disciplinary projects that blend academic content with inquiry, design, and collaboration. By studying and adapting

these and other examples, the state can develop a library of implementation options showing that durable-skill learning is operationally feasible across a wide range of contexts.

- **Launch implementation with a targeted pilot.** A pilot allows the state to see how revised standards function in real classrooms, identify the supports educators need, and determine how schools can adjust staffing, schedules, and curriculum to make implementation sustainable. The state could begin by implementing the revised standards in one or two grade levels—ideally in the middle grades—and then expand upward and downward as lessons are learned. A subset of districts willing to lead this work should be equipped with aligned curriculum materials, school design support, and professional development for teachers and leaders. From the outset, the pilot should include clear equity guardrails to ensure that new flexibility around pacing and progression expands access to deeper learning for all students, rather than privileging already advantaged students. Capturing and analyzing implementation data from these early adopters will allow the state to refine its approach before expanding to additional grades and districts. This phased strategy would also make the development of HQIM more feasible, as it would initially require creating a smaller subset of materials rather than designing content for all grades at once. By starting small, learning deeply, and scaling strategically, Massachusetts can ensure that durable-skill learning takes hold with quality and coherence.

BIG IDEA: **Build R&D Lab Schools to Power Innovation Across Massachusetts**

Massachusetts has an opportunity to identify and elevate a set of R&D Lab Schools across districts with strong readiness for innovation. Modeled after teaching hospitals, these schools would operate as research-and-development hubs where new instructional models, curriculum approaches, assessment strategies, and scheduling structures can be designed, piloted, and evaluated in real classrooms. Concentrating this work in schools with the conditions and leadership to support continuous improvement allows the Commonwealth to test promising approaches before scaling them statewide. When innovations succeed, R&D Lab Schools would serve as a structured pipeline for spreading effective practices across the state. *This network of R&D Lab Schools provides an ideal setting for a targeted pilot.*

Since the implementation of the 1993 Education Reform Act, Massachusetts has led the nation in defining educational excellence. The next phase of that leadership will depend not only on how new learning standards are written, but on how they are brought to life in classrooms across the Commonwealth. Updating the state's standards is not a technical exercise; it is the foundation for building a system that aligns what students learn with the demands of the future economy.

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