



Integrating the Curriculum to Engage and Challenge Children

Barbara A. Bradley

Ms. Carter's second grade class is in the midst of their garden project. They are addressing the essential question, "How do we take care of living things?" After learning about plants and talking with a local horticulturist, a small group of students chose and planted their seeds in cups, then dutifully watered them daily. Now the seeds have become strong, healthy seedlings ready to be transplanted outdoors.

The students study the map they've drawn of the garden to be sure they understand where to plant their seedlings. Next, they reread the directions about how far apart and how deep the seedlings should be planted in the soil. They each grab a ruler, a trowel, and their work gloves and go outside to the garden. They are eager to plant their seedlings outdoors in the warm sun but worry that they might not grow well in the less protected environment.

Carefully planting the seedlings, the students use compost they made from cafeteria waste, such as eggshells and uneaten lunches and snacks, to fertilize their plants. They water their seedlings and place in the soil a small sign with the word *Tomatoes* boldly written on it. Talking excitedly, the students head back to the classroom, wash their hands, and begin writing about their morning activities in their gardening journals.

Ms. Carter is actively engaging students in 21st century learning by implementing an integrated curriculum that helps them think deeply about content and connect their learning to real-world activities. Students also are learning and applying 21st century skills, as well as meeting standards expected by state and national initiatives.

Engaging in 21st century skills

What are 21st century skills? The Partnership for 21st Century Learning (P21) created a framework based on four areas of student outcomes (2015) that can guide our teaching (see “P21’s Framework for 21st Century Learning” for information about student outcomes).

The mission of P21, a nonprofit organization uniting education, business, and government leaders, is helping students acquire the knowledge and skills they will need to be successful in an ever-changing world. Twenty-first century skills identified by P21 include learning content, thinking critically and problem solving, communicating and collaborating, and engaging in safe and effective use of technologies. Beyond these academic, technical, and thinking skills, 21st century learning involves developing life skills such as being kind and respectful, taking responsibility and initiative, and developing ownership for one’s learning.

These skills are already familiar to teachers. What’s new is that these skills are now in the forefront of

P21’s Framework for 21st Century Learning

Core subjects and 21st century themes

Core subjects

- English, reading or language arts
- World languages
- Arts
- Mathematics
- Economics
- Science
- Geography
- History
- Government and Civics

Interdisciplinary themes

- Global awareness
- Financial, economic, business, and entrepreneurial literacy
- Civic literacy
- Health literacy
- Environmental literacy

Learning and innovation skills

- Creativity and innovation
- Critical thinking and problem solving
- Communication and collaboration

Information, media, and technology skills

- Information literacy
- Media literacy
- Information and communication technology (ICT) literacy

Life and career skills

- Flexibility and adaptability
- Initiation and self-direction
- Social and cross-cultural skills
- Productivity and accountability
- Leadership and responsibility

Adapted from “Framework for 21st Century Learning: 21st Century Student Outcomes,” P21 (Partnership for 21st Century Learning). www.p21.org/our-work/p21-framework.

teaching and learning and are being intentionally integrated into the curriculum. In the garden project, Ms. Carter’s students are engaging in 21st century skills in the following ways:

- › **Language arts:** Reading about plants and how to care for them; writing and drawing diagrams in a garden journal
- › **Social studies and mathematics:** Creating and reading maps; measuring distances between plants; considering the amount of water to provide
- › **Science:** Learning about what plants need to grow and thrive; evaluating the outcomes of their efforts to grow plants
- › **Environmental literacy (understanding the environment, addressing environmental challenges):** Planting a garden to grow food; recycling food waste by making compost
- › **Critical thinking and problem solving:** Determining which seeds to plant, how to care for them, and when to transplant seedlings outdoors
- › **Information and communication technology (ICT) literacy:** Using online resources to learn about plants; creating digital texts about their garden that include photos, diagrams, and videos
- › **Communication and collaboration:** Talking with the horticulturist; collaborating with peers to determine which seeds to plant, how to nurture the seeds, and when to plant their seedlings outdoors

- › **Accountability, responsibility:** Caring for and keeping a journal about their plants; celebrating successes and learning from failures with the plants

In short, 21st century skills are aimed at preparing students for college and/or careers and at becoming responsible citizens in a global society.

Content standards in the context of 21st century teaching and learning

In addition to these skills, content standards are important to 21st century teaching and learning. Content standards are a guidepost for what students are expected to learn in each grade and each subject. There are a number of standards that teachers may be taking into consideration when planning their curriculum including the Common Core State Standards (CCSS) (NGA & CCSSO 2013), the Next Generation Science Standards (NGSS Lead States 2013), and the College, Career, and Civic Life (C3) Framework for Social Studies State Standards (NCSS 2013). Although standards frame the content in ways that help teachers introduce new ideas and concepts, many of us wonder how educators can address them all in ways that are engaging and meaningful to students.

Fortunately, the standards discussed here call for and promote in-depth teaching and learning through real-world applications. By making connections within and

Next Generation Science Standards

Science and engineering practices	Core disciplines	Crosscutting concepts
Understanding and exploring by ■ Asking questions and defining problems ■ Planning and carrying out investigations ■ Analyzing and interpreting data ■ Developing and using models ■ Constructing explanations and designing solutions ■ Engaging in argument from evidence ■ Using mathematical thinking ■ Obtaining, evaluating, and communicating information	■ Physical sciences ■ Life sciences ■ Earth and space sciences ■ Engineering, technology, and applications of science	Helping students to make connections across science ■ Patterns, similarity, and diversity ■ Cause and effect ■ Scale, proportion, and quantity ■ Systems and system models ■ Energy and matter ■ Structure and function ■ Stability and change

Adapted from NGSS (Next Generation Science Standards) Lead States. 2013. Next Generation Science Standards: For States, By States. Washington, DC: National Academies Press. www.nextgenscience.org

across these standards, educators can present a more coherent curriculum for students. Although it is beyond the scope of this article to look at standards in detail, it is helpful for educators to understand the ways in which standards cause them to shift instruction methods.

Common Core State Standards for English Language Arts

The CCSS for English Language Arts (ELA) (NGA & CCSSO 2010a) are comprised of four strands: Reading (literature, informational texts, and foundation skills), Writing, Listening and Speaking, and Language. They challenge our thinking about literacy in several ways. First, though little has changed about the texts educators use to teach children how to read, CCSS do expect them to use complex texts to build students’ content knowledge and foster academic language. Second, to build content knowledge and to build critical thinking and problem-solving skills, students are expected to read, or listen to, text closely and provide evidence from the text, rather than rely on prior knowledge. Finally, students are expected to have a fifty-fifty split in the instructional time devoted to literature and informational text. Comparing the ELA standards with 21st century skills, it’s clear they share a focus on content knowledge, critical thinking, and communication (oral and written).

Common Core State Standards for Math

The CCSS for K–2 Math (NGA & CCSSO 2010b) are comprised of five domains: Counting and Cardinality (kindergarten only), Operations and Algebraic Thinking, Number and Operation in Base Ten, Measurement and Data, and Geometry. There are several key shifts in the way educators are expected to teach math. First, rather than cover many topics, educators are expected to place greater emphasis on a few topics. Specifically, for grades K–2, the focus is on concepts, skills, and problem solving related to addition and subtraction. Second, educators are expected to follow a coherent progression that helps students build on their understandings instead of relying on tricks or mnemonics. Finally, by focusing on conceptual understanding, procedural skills, and fluency, educators can provide students with opportunities to apply math to their daily lives.

Inquiry Arc From the C3 Framework

Dimension 1
■ Developing questions and planning inquiries
Dimension 2
■ Applying disciplinary tools and concepts • Civics • Economics • Geography • History
Dimension 3
■ Gathering and evaluating evidence
■ Developing claims and using evidence
Dimension 4
■ Communicating and critiquing conclusions
■ Taking informed action

Adapted from NCSS (National Council for the Social Studies). n.d. “College, Career, and Civic Life (C3) Framework for Social Studies State Standards: Guidance for Enhancing the Rigor of K-12 Civics, Economics, Geography, and History.” Silver Spring, MD: NCSS. www.socialstudies.org/c3/c3framework.

Next Generation Science Standards

The NGSS (2013) focus on helping students think like scientists (see “Next Generation Science Standards” for the three dimensions of standards that help students do this). At first glance, these dimensions—Science and Engineering Practices, Core Disciplines, and Crosscutting Concepts—may seem a bit overwhelming; however, the goal of the NGSS is to help students engage in and learn scientific practices, such as asking questions about a topic, conducting investigations, thinking carefully and constructing logical explanations about what they have observed during an investigation, and sharing findings with others (Science and Engineering Practices). As teachers and students engage in inquiry related to a specific subject within the sciences (disciplinary core), they are also engaging with 21st century core subjects (science, geography), relying on informational texts, and collecting and analyzing data that rely on math. Finally, educators know that it is important for students to make connections among topics, and this is the role of the NGSS crosscutting concepts.

College, Career, and Civic Life (C3) Framework for Social Studies State Standards

The NCSS (2013) recommends using a process it calls the Inquiry Arc (see “Inquiry Arc From the C3 Framework,” p.11), an instructional approach that harnesses students’ natural curiosity about people and places to present social studies in meaningful ways and promote critical thinking and problem solving. Further, the Inquiry Arc helps students become responsible, informed, and engaged citizens by teaching them to seek solutions to social problems using an evidence-based process. Thus, the C3 Framework, like the science standards, is based on inquiry and clearly aligns with elements of the 21st century skills and the CCSS ELA.

Support for implementing standards and 21st century skills

In addition to the National Association for the Education of Young Children (NAEYC), a number of other professional organizations provide support and direction as well as free resources to assist educators implementing standards. Further, several professional organizations have collaborated with P21 to provide

guidance for infusing 21st century skills into classes. Professional organizations can help educators integrate standards and 21st century skills more seamlessly to create an engaging and challenging curriculum for students (see “Professional Organizations That Support Teachers”).

Key instructional practices of 21st century teaching and learning

Integrating the wide array of standards and skills into teaching can feel overwhelming. However, engaging students in 21st century learning is possible by focusing on the following four instructional practices:

- 1. Help students focus on essential questions.** An essential question guides an inquiry or a unit of study (see “Essential Questions”). It creates a purpose and focus, and it helps students make connections among their interests, life experiences, new understandings, and authentic problems. Essential questions lead to genuine inquiry, require students to provide evidence to support their position, and lend themselves to thought-provoking discussions that help students consider alternative ideas. For example, instead of asking, “What makes Frog and Toad friends?,” educators can ask, “What makes a good friend?” This question allows educators to address an objective like “describe characters” (CCSS ELA) or help students understand personal or civic responsibility (C3 framework). The ensuing discussion could include describing what made Frog and Toad friends along with other examples of friendships from books or students’ lives as a means of answering the bigger question. Addressing specific standards is important in the inquiry process because doing so provides students with the content knowledge, skills, and strategies needed to think more deeply about the question. To achieve 21st century learning goals, educators can help focus students on essential questions that integrate specific standards and achieve learning goals. Essential questions as part of inquiry motivate students and help make learning relevant and more meaningful to them.
- 2. Create opportunities for authentic learning.** After educators identify an essential question, the next task is to create authentic learning opportunities or call upon real-life situations that give students opportunities to gather evidence, solve problems, and support their claims or choices. For example, in the

Professional Organizations That Support Teachers

Council for Exceptional Children (CEC)—www.cec.sped.org

International Literacy Association (ILA)—
www.literacyworldwide.org

International Society for Technology in Education (ISTE)—
www.iste.org

National Association for the Education of Young Children (NAEYC)—www.naeyc.org

National Art Education Association (NAEA)—
www.arteducators.org

National Council of Teachers of Mathematics (NCTM)—
www.nctm.org

National Council for the Social Studies (NCSS)—
www.socialstudies.org

National Science Teachers Association (NSTA)—
www.nsta.org

Society of Health and Physical Educators (SHAPE America)—www.shapeamerica.org

case of the essential question “What makes a good friend?,” students might be invited to explore what their peers think about friendship. Students might first read *Enemy Pie*, by D. Munson (2000) or listen to a recording of *The Rainbow Fish*, by Marcus Pfister (1999). Afterward they could develop a list of character traits based on friendships depicted in the stories and create questions about friendship to use in interviews with their classmates. Although these activities may provide insight, they can also stimulate interesting issues, such as “Friends share secrets, but can we ever share a friend’s secret with someone else? If so, under what circumstances can we share a friend’s secret?” Essential questions require students to dig deeper into the topic, which uncovers more questions—an important aspect of the learning process. Ultimately, as students answer the essential question by addressing authentic problems, they will need to use logical reasoning and provide evidence for their claims.

3. Build in collaboration with others. Interacting well with peers and teachers is important for learning, just as interacting well with colleagues and clients is important in the workforce. As educators create authentic learning contexts, it is important to build opportunities for students to interact with others because this helps them learn to cooperate (work together but not necessarily toward a common goal) and collaborate (work together toward a common goal). With guidance, students can begin learning about their roles and responsibilities during group work, being flexible and making compromises, and working respectfully with others. For example, when interviewing others about friendship, students will need to ask questions in a clear and concise manner, and listen attentively to responses. Reminders about collaboration etiquette, such as sitting up straight, looking at the speaker, smiling, and saying thank you, are also important.

4. Provide multiple methods for communicating with others. Typically, students share outcomes of their exploration of essential questions in group conversations. Students are asked to follow agreed-upon rules for discussions—listen attentively, ask questions, and build on others’ comments. But the findings resulting from essential questions can also be communicated through writing and drawing, photographs, video and plays, and other performances. For example, students can share information in the form of summaries, reports, or brochures, or write

stories, poems, or plays. Communication can also be in a digital format, such as a posting on a class blog, creating a digital story, taking digital images, or producing videos. In addition to sharing learning, another purpose of communication is to take action to create change. Learning is not only about gaining new information but about doing something useful

Essential Questions

How to Identify an Essential Question for Your Class

- Think about the standards and content you will be teaching your students. What are important and enduring ideas? How do these ideas relate to real-world problems or questions?
- Write an essential question that will be interesting to your students, encourage them to think deeply about a topic or issue, and invite them into ongoing conversations.
- An essential question does not have a right or wrong answer but does require students to provide evidence or justification for their responses.

Things to Consider When Choosing an Essential Question

- Is the essential question intriguing and thought provoking?
- Does the essential question spark students’ curiosity and sense of wonder?
- Does the essential question engage students in real-life problem solving?
- Is the essential question open-ended and does not have a right or wrong answer?
- Does the essential question not have a simple answer but require students to provide evidence or justification?

Examples of Essential Questions

- How can we make our (school, town, city) better?
- How can we protect and take care of (animals, the environment)?
- What kinds of TV programs are healthy for us to watch?
- What would happen if we took away all (technology, clocks, music)?
- Who would you take on an expedition and why?
- How can one person make a difference?
- Are people *either* good or bad?
- What does it mean to “grow up”?



with that information. With respect to the question “What makes a good friend?,” students could produce a short public service announcement to share during the school’s morning announcements to help others learn about the importance of friendship and how to be a good friend.

Twenty-first century teaching and learning in a kindergarten classroom

Let’s see how Mr. Oliver engages his kindergarten class in 21st century learning as they examine traditions as part of a social studies unit. In the following vignette, key instructional practices and skills incorporated in the activities are highlighted in parentheses.

After reading aloud *The Relatives Came*, by Cynthia Rylant, students enthusiastically share information about their families and family gatherings (P21 Skills, CCSS ELA, C3, Communication). Mr. Oliver introduces the idea of family traditions, explaining that traditions are activities that a family repeats over time and

that are often passed from one generation to the next. With guidance, students brainstorm family activities that include traditions such as birthdays, holidays, and vacations—and even the first day of school. Finally, Mr. Oliver shares the essential question that guides their inquiry: “Why is it important that people have traditions?”

Over several days, students focus on family traditions as Mr. Oliver reads aloud and the students discuss books such as *Throw Your Tooth on the Roof: Tooth Traditions From Around the World*, by Selby Beeler (2001), *How My Family Lives in America*, by Susan Kuklin (1998), *The Keeping Quilt*, by Patricia Polacco (2001), and *Too Many Tamales*, by Gary Soto (1996) (P21 Skills, CCSS ELA, C3, Communication). As students gather evidence to support their understanding of traditions in general, they discuss questions to deepen their understanding of their own family traditions that will help them address their essential question (see “21st Century Teaching and Learning During a Traditions Unit in Kindergarten” for the questions and unit framework).

21st Century Teaching and Learning During a Traditions Unit in Kindergarten

Working together in small groups, and with support from Mr. Oliver, students develop a questionnaire that they use to interview their parents and relatives about their family's traditions (P21 Skills, C3, Collaboration). While adult family members write short responses, children draw pictures to help them remember their family traditions. In class students share and compare family traditions. Mr. Oliver helps students place their family traditions into different categories (e.g., holidays, summer vacation, special events) that they use to create a book of family traditions for their class library (P21 Skills, CCSS ELA, Communication).

After completing their book, Mr. Oliver reads it aloud, and children revisit how traditions make them feel and the ways traditions provide family members with a sense of belonging (P21 Skills, C3, Communication). To lead students toward an authentic learning opportunity, Mr. Oliver wonders aloud whether traditions might bring the class closer together, like a family. Students quickly become excited about starting their own class tradition. A tradition that involves food is a popular idea, and soon they settle on an ice cream party. The students discuss how they might pass this tradition on to the next kindergarten class. After much thoughtful conversation, students suggest inviting preschool children who will be attending the elementary school next year to their ice cream party (P21 skills, Authentic Learning, Collaboration, Communication).

While working behind the scenes to make this happen, Mr. Oliver helps his students plan the ice cream party. The kindergartners have talked about ways traditions create a sense of belonging, so they decide to give the preschoolers a tour of the school, involve them in some of their favorite activities, and give them an *All About Kindergarten* book to take home (P21 Skills, CCSS ELA, C3, Authentic Learning, Collaboration, Communication). Recognizing the enormity of his students' plan, Mr. Oliver explains the idea of committees to them and helps them divide into small groups to tackle different tasks. With the support of parent volunteers, each committee goes to work making books, writing invitations, or planning the day's activities.

Essential question	■ Why is it important that people have traditions? • How do I feel when I participate in family traditions? • Why are my family's traditions important? • How are my family's traditions the same or different from those of my friends? • Do traditions need to be the same for all families?
Authentic learning	■ Start a new tradition for rising kindergarten students ■ Invite preschool students to tour the school, participate in favorite kindergarten activities, and celebrate with an ice cream party
Collaboration	■ Small groups create a questionnaire about family traditions ■ Small groups share and compare family traditions ■ Committees plan and prepare for the First Annual Ice Cream Party
Communication	■ Create and share a class book about family traditions ■ Write an <i>All About Kindergarten</i> book to give to preschool children

Finally, the day of the First Annual Ice Cream Party arrives with much excitement. It's a success, and ends with the kindergartners feeling pride and accomplishment. While it's too soon to tell how long this tradition will continue or whether Mr. Oliver's students, now first graders, will create traditions for future classes, there is no doubt that their ice cream party will live on as a meaningful memory.

Final thoughts

Engaging students in inquiry based on thought-provoking questions and authentic activities is a hallmark of 21st century teaching. This kind of teaching promotes deep thinking across multiple content areas and lets students exchange ideas and solve real problems. Integrating content standards in

the curriculum lets early childhood teachers engage students in 21st century inquiry-driven learning by addressing essential questions and creating opportunities for collaboration and communication that lead to meaningful and memorable authentic learning.

References

NCSS (National Council for the Social Studies). 2013. *The College, Career, and Civic Life (C3) Framework for Social Studies State Standards: Guidance for Enhancing the Rigor of K–12 Civics, Economics, Geography, and History*. Silver Spring, MD: NCSS. www.socialstudies.org/system/files/c3/C3-Framework-for-Social-Studies.pdf.

NGA (National Governors Association Center for Best Practices) & CCSSO (Council of Chief State School Officers). 2010a. *Common Core State Standards for English Language Arts and Literacy in History/Social Studies, Science, and Technical Subjects*. Washington, DC: NGA/CCSSO. www.corestandards.org/assets/CCSSI_ELA%20Standards.pdf.

NGA & CCSSO. 2010b. *Common Core State Standards for Mathematics*. Washington, DC: NGA/CCSSO. www.corestandards.org/wp-content/uploads/Math_Standards.pdf.

NGSS (Next Generation Science Standards) Lead States. 2013. *Next Generation Science Standards: For States, By States*. Washington, DC: National Academies Press. www.nextgenscience.org.

P21 (Partnership for 21st Century Learning). 2015. *Framework for 21st Century Learning*. Washington, DC: P21. www.p21.org/storage/documents/P21_framework_0515.pdf.

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