Citizen-Learners

A Framework for 21st Century Excellence in Education

Mara Krechevsky
Daniel Gray Wilson
Emily Gonzalez

Project Zero, Harvard Graduate School of Education

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Achieving excellence in education this century requires a focus on developing citizen-learners of all ages who can navigate the complexities of an uncertain world toward creating a more just, humane, and sustainable future. In this paper, we identify four essential questions that can guide educational experiences across age levels and shape the development of future curriculum: Who are we as citizen-learners? What do we learn? How do we learn? What do we do with what we learn? We provide a list of grade-spanning competences, such as observe & reflect and engage in civic dialogue, that offer provisional answers to each essential question. We also identify a set of core capacities of citizen-learners—generating knowledge, navigating complexity, building relationships, and effecting ethical change—and connect them to the Brazilian National Core Competencies. Examples from Project Zero research throughout the paper illustrate what the capacities look like in practice.

"The conception of education as a social process has no definite meaning until we define the kind of society we have in mind." - John Dewey

Overview

Schools in the 21st century need to prepare students to be effective participants in a world with jobs, problems, and technologies that do not yet exist. Although current trends such as globalization, emerging digital technologies, and climate change suggest possible societal futures, much is still unknown about the personal and civic lives learners are likely to live. What *is* known is that successfully navigating these uncertainties depends on society's ability to foster informed, empowered, ethical, and adaptive citizens. In the spirit of Dewey's statement, the challenge for 21st century schools is to articulate the kind of society we want to live in, and to normalize and integrate complexity and uncertainty in pursuit of this goal.

An education that aims to support *excellence* in the 21st century means more than creating a curriculum of outstanding or superior quality. Excellence in education also includes structures and processes used in ethical ways, with ethical role models and experiences that are personally engaging to students and teachers (Gardner, Csikszentmihalyi, & Damon, 2001; Gardner, 2010). Thus, an excellent education is high in quality, grounded in and across disciplines, ethically carried out, and meaningful to those involved. How can schools accomplish this goal? By reframing their purpose: the cultivation of *citizen-learners*.

C*itizen-learners* recognize the complexities and uncertainties of the world in which they live. They develop and share knowledge, form connections to their community, and take meaningful action to support their own and others' well-being. They are prepared to work with others to explore pressing issues of personal and communal significance, such as environmental sustainability, global migration, or the digital revolution. Citizen-learners act in bold yet caring and reflective ways to improve their own lives and the lives of others.

This white paper describes an emerging educational framework that is informed by key ideas and practices from over 50 years of Project Zero educational research and from other learning organizations. We identify four essential questions in service of fostering citizen-learners, along with a set of core capacities and related competences. We also connect the capacities to Brazil's National Core Competencies. Classroom examples from different grade levels illustrate what the competences look like in practice. A subsequent paper will outline recommendations for design principles, processes, and experiences for a professional development model to support such a curriculum.

Background

In 2020, Centro Educacional de Campos (CEC), a k-12 school network and teacher development center in Brazil, and Project Zero (PZ), a research center at the Harvard Graduate School of Education, began a collaboration to develop an innovative k-12 framework to guide curriculum and professional development to foster the thinking, learning, and entrepreneurial skills needed in the 21st century. Although CEC's near-term focus is its network of schools and centers, CEC is ultimately interested in how such a framework can influence schools throughout Brazil, supporting educators and students by providing essential tools for living ethical and meaningful personal, social, and professional lives. After this one-year project, PZ and CEC will evaluate the prospects of extending the work to potential new phases of implementing and refining the framework and subsequent curriculum and/or teacher development in selected CEC schools, CEC teacher development centers, and contexts beyond Brazil.

The proposed framework draws on a variety of sources, including semi-structured interviews with 18 long-time Project Zero researchers, and five researchers and educators in the field of K-12 education; a selection of relevant books, articles, and websites by PZ researchers and other scholars and educators; and regular meetings with researchers from the University of Sao Paulo and PZ. We also reviewed educational frameworks such as OECD's Future of Education and Skills 2030, the UN's Sustainable Development Goals and Education 2030, The Partnership for 21st Century Learning Skills (USA), Next Generation Science Standards (USA), and EL Education (a US-based educational model and network), among others. These frameworks provided guidance for the ideas and qualities we chose to highlight and develop in the core capacities and competences.

A team of three researchers at PZ (the authors of this paper) produced multiple iterations of possible frameworks based on the above sources. We mapped these drafts against Brazil's National Core Competencies and solicited targeted feedback. We identified powerful illustrative examples from a variety of PZ projects, and coded them for central elements of the framework, both as a kind of "existence proof" and to surface gaps or questions with regard to the internal coherence of the framework. We also convened two gatherings of a small group of experienced PZ researchers to critique the framework and share examples of curriculum experiences from their own or others' work. We are deeply grateful to Ulisses Araujo and Valeria Arantes from the University of Sao Paulo who participated in regular meetings and offered vital specific feedback and general guidance to this work. A special thanks to Tina Blythe, Flossie Chua, Howard Gardner, Tina Grotzer, Carrie James, David Kidd, and David Perkins from Project Zero who were instrumental in responding to different versions of the emerging framework.

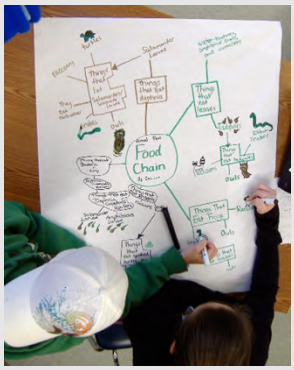
Although the following ideas are intended to inspire and inform a path forward for Brazilian education, we note several caveats. The framework is shaped by the beliefs, values, and perspectives of educational researchers at PZ, a research center at a select private university in the United States, comprised largely of researchers who identify as white. Although the authors of this paper have worked in a variety of contexts around the world, and have attempted to link the concept of *citizen-learners* to larger global themes and Brazilian trends, we acknowledge that our ideas are culturally situated. The framework is conceptually grounded in Western ideals of democratic participation and a social-constructivist perspective of human development and learning. Further work is necessary to test the claims we put forth about citizen-learners within the cultural context and needs of the learners, educators, and families in the CEC communities and Brazil.

Opening Illustration: The Vernal Pool

The Vernal Pool: 7th Graders Investigate & Protect a Local Habitat[1]

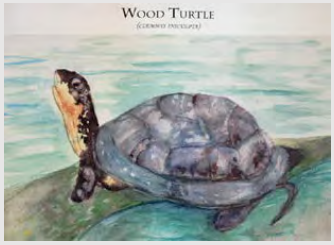
Mandy Locke, a science teacher, and Matt Leaf, an English teacher, at Four Rivers Charter Public School in Greenfield, MA, facilitated a year-long interdisciplinary investigation of a local ecosystem to advance seventh graders' writing, scientific reasoning, and citizenship skills. The students' research entailed a four-month project to obtain state certification for a vernal pool (a small, seasonal wetland) so it could be protected, and to create a field guide. Each student chose a species to study for the field guide.

Students visited a nearby vernal pool eight times to observe and collect data on biotic and abiotic factors, including small organisms easily missed by the human eye. They made scientific measurements of air and water temperature and took notes and photographs to provide the data necessary to have the pool certified. The students' inquiry surfaced several misconceptions about the relationship between the air and water temperature and the energy sources for the pool.



When several students wondered, "Why doesn't the pool fill up with leaves?" the teachers brought the question to the class to challenge the students' misconceptions about food webs. Mandy facilitated a discussion about how the pool gets the energy to support life. To further support students' understanding, Mandy assigned a reading about food webs. She also asked small groups of students to map the flow of energy on a large sheet of paper, which they repeated individually for their own species.

Writing the guidebook took multiple drafts. Students gave each other feedback based on a rubric they developed with their teacher for physical depictions and written descriptions. Over time, their paintings and written descriptions improved. The final page about the snail began, "Have you ever seen a male snail or a female snail? I bet you haven't because there are no males or females. They are both!" The description of the blue spotted salamander began, "If you get your leg cut off, will it grow back? It will in the case of the blue-spotted salamander," followed by other intriguing details. The students also formed committees to work on the book cover, a glossary, and a computer program to publish the book.



The learning experience culminated in the creation of a 156-page field guide including scientific descriptions, folktales, and watercolor paintings of thirty-five species, and state certification for the vernal pool. The local newspaper announced the students' success in getting the pool certified, and students donated the field guide to the local library.

[1] To read the full learning portrait of this classroom from an *EL Education* school, see "The Vernal Pool: Seventh graders investigate and protect a local habitat," in Krechevsky et al. (2013), *Visible learners: Promoting Reggio-inspired approaches in all schools*, pp.13-19.

Citizen-learners: Concept and Core Capacities

The Vernal Pool example highlights how middle-school students deepened their scientific understanding and developed their writing and drawing skills in service of a larger community goal. Along the way, their investigation uncovered the complexity of the local ecosystem. Although the work was hard, the students supported and inspired each other, motivated by the goal of contributing to something larger than themselves. The final products of the vernal pool certification and the creation of the field guide generated an enormous sense of individual and collective pride and accomplishment. In sum, this example illustrates a promising pathway for creating excellence in education: cultivating *citizen-learners*.

The terms *citizen* and *citizenship* are often interpreted in different ways to serve different purposes. For example, a narrow, legal interpretation of the term *citizen* describes an individual's status, rights, and responsibilities in a political unit. Sometimes the concept of *citizenship* is used as a way to exclude certain groups, such as children, women, or slaves, from full membership in a community. The philosopher Kwame Anthony Appiah (2006), following the ancient Greek philosopher, Diogenes, argues that all human beings can be considered "citizens of the world." Along with Appiah (and Diogenes), we aim to transcend the legal interpretation of *citizen* and consider citizens as *co-creators of a way of life* or *world-building* (Allen, 2016).

Many school mission statements identify academic excellence and the ability to contribute to a democratic society as separate goals, often accompanied by a set of academic expectations and a set of civic expectations. We propose deliberately combining the civic and academic dimensions of learning, as illustrated by the Vernal Pool example, and placing *citizen-learners* at the heart of the teaching and learning process. The hyphen in citizen-learners is intentional; it signifies the overlapping processes of becoming a citizen and a learner in and outside of school. We make three claims: that children are citizens in the present as well as the future; that learning is an ongoing activity that takes place over a lifetime; and that educational institutions like schools need to challenge long-held assumptions about the relationship between the individual and the group, and keep the community in mind right from the start.

The UN Convention on the Rights of the Child (1989), the most widely ratified international human rights treaty, identifies not only children's *human* rights to protection from violence and exploitation, and to the provision of an adequate standard of living, but also children's *civil* rights to participate in civic life. It supports a view of children not just as future citizens, or citizens in training, but as current, active citizens in the here and now, with the right to take part in and contribute to cultural and civic activities. Schools are ideal places for children to learn critical human capacities for participating in democratic society—how to offer, receive, and modify ideas; how to understand and accept different points of view; and how to listen.

In schools, children do not just learn content; they learn how to learn, including how to learn from and with others. Learning does not stop after schooling is completed. Especially in a digitally connected world, with multiple sources of knowledge at the ready, learning should be considered a lifelong activity. Students need to develop the skills, knowledge, and dispositions to pursue ethical and meaningful lives, and to make mistakes and negotiate the challenges along the way. Citizen-learners are actively engaged and reflective members of a community, who learn from their successes and missteps to inform the future.

Despite the rhetoric affirming the importance of group learning, most educational settings continue to focus on individual mastery and achievement. In early childhood, a typical unit begins with "all about me," slowly branching out to consider the family, class, school, and larger community. In many ways, this sequence makes sense. However, we would like to suggest that another way to understand the relationship between individual and group is by viewing them as mutually constitutive. That is, from the beginning of formal education, individual learning occurs with the world or community in mind. As kindergarten teacher Melissa Tonachel used to tell families of her students: "Your child's education is not an individual pursuit."

In this admittedly aspirational view, citizen-learners both possess and value the following capacities in service of creating a more just, humane, and sustainable world.

Generate knowledge

Learning is a consequence of thinking (Perkins, 1992). Citizen-learners actively participate in solving problems or creating products that are valued in a culture. They learn by constructing and co-constructing knowledge and meaning, rather than just passively receiving information. Citizen-learners recognize the designed dimensions of the world, and the systems and objects in it. They exhibit different intellectual strengths, e.g., musical, linguistic, spatial, and logical-mathematical (Gardner, 1983; 1993), and they engage cognitively, emotionally, ethically, and aesthetically in identifying and solving real-world problems. Citizen-learners are also aware that, as one of many organisms on earth, they are environmental stewards who bear responsibility for the impact of their actions on the planet (Grotzer, 2020). In the classroom, teachers do not just transmit knowledge, but also involve students in producing knowledge by engaging them in problem- or project-based learning as individual and group learners.

Navigate complexity

In an increasingly uncertain world, it is difficult to know which bodies of knowledge will be most helpful for understanding and navigating the complexities of life. Choices of content should be driven by considering what will matter in the lives citizen-learners are likely to live (Perkins, 2014). For example, disciplinary and interdisciplinary lenses can reveal how the contemporary physical, social, artistic, and other worlds work. A more connected and globalized planet leads to an increasing need to learn how actions affect others, and to develop humane conduct and caring mindsets. Citizen-learners will benefit from topics that connect to personal interests and communal goals, and that empower them to take effective action over their lifetimes in the local and global communities. In the classroom, teachers might identify key disciplinary skills, concepts, or knowledge for their subject area and connect them to important local or global issues, organizations, or events, as well as students' interests.

Build relationships

Citizen-learners learn more than content; they also learn how to learn in a way that fits with the kind of people they want to become and the world they want to live in. Relationships are a fundamental pathway for different forms of knowing. In order to live, work, and play together effectively, citizen-learners build relationships that support their own and others' learning. They learn to make careful observations, to recognize and understand their own and others' emotions, and to respect and exchange different points of view. Citizen-learners investigate the world around them, seeking and receiving feedback on their ideas and theories. They make their thinking and learning visible in order to revisit and reflect on their own and others' learning. In the classroom, teachers might engage students in close observation of an artwork or object to provoke their assumptions about a topic, and then ask them to choose an area of interest to research together and share what they learned.

Effect ethical change

Citizen-learners demonstrate their understanding by applying what they know in new situations. They strive to keep in mind the ultimate goal of creating a more just, humane, and sustainable world. Understanding is not just something citizen-learners *have* or *possess;* they also *perform* or *act* on their understanding in diverse contexts (Perkins & Blythe, 1984; Wiske, 1998). Citizen-learners co-create a way of life by engaging in civil discourse and listening to each other; sharing stories and making diverse voices heard; adopting and pursuing causes for the common good; and envisioning new frames, processes, and values for society (Allen, 2016). Classroom teachers might look for actionable issues related to their subject matter that would benefit from multiple voices, civic action, or imagining possible solutions.

The students investigating the Vernal Pool reflect these capacities of citizen-learners. They generate knowledge about the pool and its inhabitants in service of advocating for its protection by the state. They uncover misconceptions about the food web that will inform their understanding about ecosystems in the future. They also learn from and with each other by considering each other's questions, exchanging feedback, forming committees, and creating a shared product with a larger purpose.

The capacities also connect to several historical traditions and contemporary goals in Brazilian education. The notion that education is a political activity that actively engages learners in forms of social change is a cornerstone contribution of Brazilian educational philosopher, Paulo Freire (1998). Freire's view that learners are active constructors of, and participants in, their political worlds has had a lasting impact around the world, and is synergistic with the capacities of citizen-learners. Connections can also be made to Brazil's national core competencies (BNCC) (see Appendix A). For example, *lifelong learning*, *communication skills, work and life project*, and *citizenship* are embedded throughout the capacities. *Critical thinking*, *self-knowledge and self-care* can be considered part of "generate knowledge." *Ethics* and *empathy* connect in particular to "navigate complexity" and "effect ethical change," and *aesthetic sensibility* is reflected both in "generate knowledge" and "build relationships." Although some elements of the BNCC such as *digital literacy* are not explicitly connected to a single capacity, developing digital literacy and increasing digital access can be addressed across all four capacities. In addition, as will become apparent in the next section, several components of the citizen-learner capacities, such as "challenge assumptions" and "make thinking and learning visible" extend beyond the BNCC. However, this may be due to our limited knowledge of the BNCC.

The Citizen-Learners Framework

Four Essential Questions

An educational framework for 21st century learners needs to speak to questions of students' and teachers' identity; the academic content and how it gets taught; and methods for determining impact. The following questions address each of these areas. *Who are the learners? What do they learn? How do they learn it? What do they do with what they learn?* Below, we respond briefly to each question with reference to the idea of citizen-learners, followed by a more detailed explanation of the capacities and competences and a short classroom example. We also include a diagram of the four questions and related competences.

- ***Who are we as citizen-learners?*** Answers to this question draw on an understanding of human beings as fundamentally social as well as individual learners who are constantly constructing and reconstructing knowledge.
- ***What do citizen-learners learn?*** Answers to this question take a stand on *what* is worth learning now and in the future by naming criteria for understandings that matter most for navigating a complex and uncertain world.
- ***How do citizen-learners learn?*** Answers to this question describe how learning happens when schools are viewed as places of inquiry that honor children's and adults' social, emotional, esthetic, physical, and ethical forms of knowing, as well as scientific analysis.
- ***What do citizen-learners do with what they learn?*** Citizen-learners demonstrate their learning in and across contexts by expressing and listening to the voices of others, including those who are often silenced, engaging in civic dialogue, taking purposeful action, and imagining new possibilities.

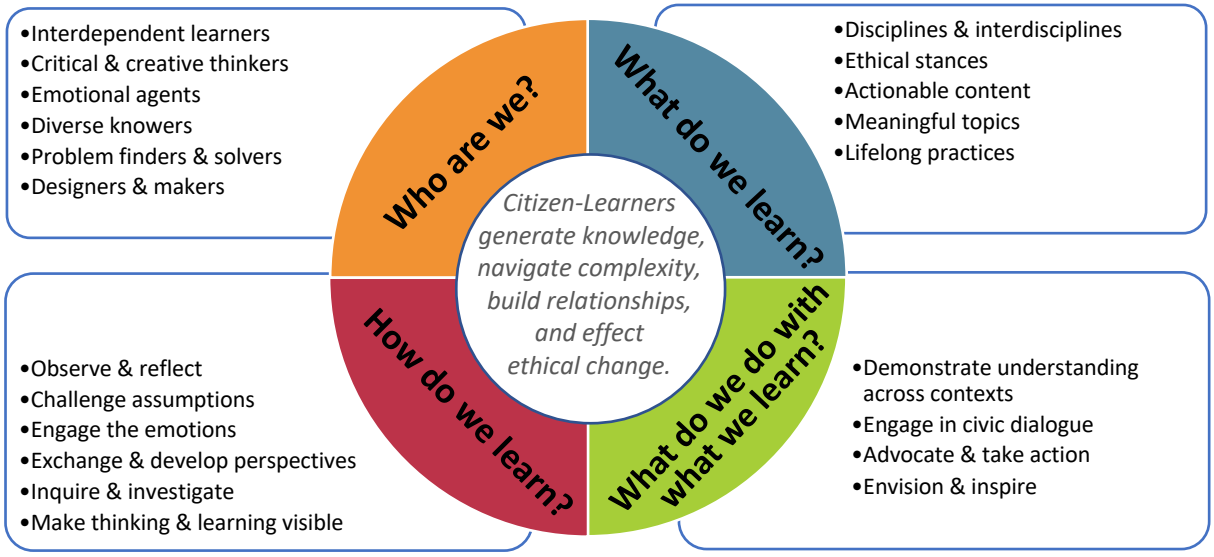


Figure 1: The Citizen-learners Framework

Who are we as citizen-learners?

Citizen-learners view learning as fundamental to what it means to be human. They see themselves as curators and co-creators of a way of life and the world around them, generating individual and collective knowledge about matters of personal, local, and global significance. This image of citizen-learners as powerful, capable, caring, and diverse thinkers and knowers, with the capacity to shape and reshape the world, is at the center of the teaching and learning process. In the classroom, teachers might engage students in collective problem- or project-based learning, with opportunities to apply and communicate what they are learning in relevant and meaningful ways.

- **Interdependent learners:** Thinking and learning are fundamentally social endeavors, in which learners create knowledge and meaning interdependently. Citizen-learners are not just passive

receivers of information; they also actively construct ideas for themselves and with others. As the world becomes more interconnected, understanding oneself as an individual and group learner becomes more important. Whether through small face-to-face conversations or large-scale digital platforms, engaging with the ideas of others is essential for learning.

- **Critical and creative thinkers:** Good thinking is as much a matter of disposition as skill (Perkins et al., 2000). Citizen-learners think *about* and *with* the content of what they learn in order to craft insights, develop understanding, and imagine new possibilities. Motivation, attitude, values, and habits of mind all play key roles in fostering critical and creative thinking.
- **Emotional agents:** Citizen-learners experience a range of emotions from dissonance, conflict, frustration, and confusion to joy, excitement, empathy, and curiosity. They strive to recognize, accept, sit with, and understand their emotions, and to attend to the feelings of others. Emotions drive their engagement in deepening their learning.
- **Diverse knowers:** Human beings differ from one another along a variety of cultural and cognitive dimensions. Citizen-learners draw on a range of intelligences and ways of knowing, such as linguistic, logical-mathematical, musical, and bodily-kinesthetic (Gardner, 1983; 1993), as well as everyday repertoires of diverse cultural practices and experiences. When citizen-learners represent their thinking in different ways, they deepen their own understanding, their ability to understand others, and others' abilities to understand them.
- **Problem finders & solvers:** Both identifying and solving problems are critical to generating knowledge. While problem-solving entails devising and applying solutions to a known problem, problem identification is equally, if not more, important. In problem finding, citizen-learners scan the world for issues that need to be understood and acted upon. Once a problem is found, before rushing to solve it, citizen-learners benefit from slowing down to investigate different ways of understanding the problem and stepping outside their initial assumptions.
- **Designers & makers:** Citizen-learners see themselves as playful explorers, with the capacity and disposition to shape the world through building, tinkering, re/designing,

The Many Stories Library Project: Sharing Untold Stories to Understand Who We Are Error! Bookmark not defined.

East End Community School, Portland, ME, USA, 5th grade

In her TED Talk, "The Danger of the Single Story" (2009), Nigerian author Chimamanda Adichie proclaims that, "Stories matter… many stories matter." Adichie goes on to suggest that human lives can never be fully captured by a single story. In 2013, five fifth-grade teachers in Portland, Maine, USA, a refugee resettlement community, led 72 students in an investigation of culture, identity, perspective-taking, family history, and the many roles and worlds they inhabit.

After watching the Adichie video, students surveyed the contents of their school library to see which perspectives might be missing. Among other things, the survey revealed that there were no or very few books about some of the students' countries of origin, such as Iraq, Sudan, and Somalia. Teachers invited children to write their own untold stories in order to teach readers (or even change their minds) about who they were. First, students analyzed other books to understand what makes a "good story." They explored stereotypes in literature and how their own stories could make a positive contribution. Teachers introduced the use of metaphors and Venn diagrams to help students understand the complexity of culture and personal identity. Finally, students conducted and analyzed interviews with family members to inform their writing. Each student was assigned a writing partner to provide feedback as the work progressed.

A major goal for the stories was that they share an aspect of the students' identity that would be instructive for others. Three questions kept students grounded in the purpose of their writing: "Why does this story matter to me? Why does it matter to people in my community? Why does it matter to the world?" At the end of the project, the students' stories were published in a book "Our Many Stories," which they donated to the school and local libraries. (The book became a "best-seller" for fourth grade students, in particular!)

[2] To read the full case, see: Mansilla, V. B., & Rivard, M. (2014). "The Many Stories Library Project: Sharing untold stories to understand who we are" (pp. 1-21). *Milestone Learning Experiences: A guide for teachers*.

or hacking (Clapp et al., 2017). They feel empowered to inquire through imagining, making artifacts, and building or rebuilding their worlds. They are sensitive to the designed dimension of the physical and conceptual environment, and to opportunities to make objects and systems more effective, ethical, or beautiful. They are appreciative audiences for a range of artistic and cultural activities, artifacts, and experiences.

What do citizen-learners learn?

A common criticism of what gets learned in school is that it is not likely to matter in the lives learners are likely to live (Perkins, 2014). In an unpredictable and changing world, citizen-learners learn content that will allow them to understand and navigate complexity in different contexts over the course of a lifetime. They explore topics that are vital in today and tomorrow's world, such as climate change, ecological sustainability, energy, poverty, and health (UN General Assembly, 2015). Classroom teachers might address key disciplinary or interdisciplinary knowledge and understandings that will inform students' actions and ethical viewpoints now and in the future. Such content includes:

- **Disciplines & interdisciplines:** Disciplinary and interdisciplinary knowledge and ways of thinking afford insight into the citizen-learners' world. They are epistemological lenses for examining phenomena, posing questions, deepening understanding, and solving problems. Generative disciplinary or interdisciplinary topics address key ideas and methods in and across disciplines, and offer multiple entry-points for considering contemporary challenges such as planetary health, human rights and justice, and the persistence of poverty.
- **Ethical stances:** Citizen-learners learn content that informs their views about what is good, equitable, and just, and shapes their moral decisions about personal, local, and global issues. Observing role models and experiencing principled structures and procedures supports the development of ethical, humane, and caring mindsets. Citizen-learners also

Grappling with Greatness: Negotiating Different Points of View in AP Literature Error! Bookmark not defined.

Joan Soble, Cambridge Rindge & Latin High School, Cambridge, MA, USA; 11th-12th grade

Thalia: I'm just a little confused because… I'm just like listening to everybody's points of view right now and, I don't know… I got that some of you think that greatness can't be achieved by everybody, and then Violet said that greatness can be achieved by like… someone who's… a normal guy, like a janitor. I'm just like trying to put everything together because it just doesn't make sense how… you guys don't think… everybody is born great. . .
Violet: Well, we all have different point of views.
Thalia: I should probably write [what I'm trying to say] down.

Students in Joan Soble's AP English Literature and Composition class examined human greatness as a topic of study during the 2010-11 schoolyear. Joan believed that older high school students, about to enter adulthood, were actively engaged in imagining their future in a complex world where concepts of greatness and celebrity were often confused. She hoped that considering different types of greatness in works of literature might shape students' choices about what to strive for, and whom to help, champion, learn from, and even reward.

Joan suspected students like Violet might be avoiding having their individual thinking challenged by simply applying the label "different" to views that did not align with their own. She asked students to interview each other about the origins of their ideas about greatness to engage more deeply with each other's ideas. Along with complexifying their understanding of greatness, students deepened their understanding of the value of listening and the purpose and power of developing one's thinking in negotiation with others. They became willing to reconsider and even change their ideas in light of their peers' perspectives.

The students generated a list of 14 generalizable statements about greatness, such as "There is a strong relationship between goodness and greatness," "Greatness requires morality," and "Greatness requires awareness of one's effect on others." By the end of the unit, students came to care deeply about the topic, to accept its complexity, and to value the multiple ways of understanding it.

[3] AP refers to "Advanced Placement" or college-level courses students can take in high school in the US. To read the full learning portrait, see: Krechevsky, M. et al., (2013), pp.20-25.

reflect on the impact of their actions on others and the community.

- **Actionable content:** Citizen-learners explore content that is likely to inform effective action such as developing a position on energy conservation, contributing to a cause, or voting in a local election. Actionable content also includes the ability to act in accordance with one's passions, values, or beliefs, and to follow through on one's commitments. Whenever possible, curricular connections are made to authentic workplace contexts (e.g., construction sites, the newsroom, the local theater) and/or significant local, regional, national, or world events.
- **Meaningful topics:** Citizen-learners invest emotionally and intellectually in topics that speak to their interests, values, and motivations. The content they learn becomes meaningful when it relates to their goals and interests. Although people find meaning in different contexts, citizen-learners often pursue topics that connect to shared values or interests in a community. This enables them to become part of something bigger than themselves.
- **Life-long practices:** Much of what gets learned in school tends to be forgotten once citizen-learners leave school. Citizen-learners need to encounter topics that are likely to inform thought and action in significant ways and in varied circumstances over the course of a lifetime. This includes every-day and larger themes such as negotiating interpersonal relationships, understanding a news article, making a health care decision, or deciding where to live.

How do citizen-learners learn?

In a complex and interrelated world, citizen-learners need to form relationships within and across cultures, ethnicities, languages, economic status, and religious beliefs. They build understanding by challenging assumptions, exchanging perspectives with others, slowing down to notice and reflect, and investigating the world around them. In the classroom, teachers might provoke students' thinking by sharing a surprising claim or piece of art and asking them to develop and research a hypothesis, and then present their findings to their peers.

Nurturing Global Competence through Cross-Case Analysis Error! Bookmark not defined.

Kottie Christie-Blick, Blauvelt, NY, USA, 4th-5th grade

In the fall of 2012, Kottie Christie-Blick's students experienced firsthand the impact of Hurricane Sandy on their community, so the problem of sea levels rising was a pressing one. Kottie designed the "Climate Stewards Go Global!" unit to enable her students to develop a scientifically informed view of climate change, and to feel empowered to take action. The unit fostered students' understanding by asking them to compare the relative impact of rising sea levels on coastal communities in New York and Cape Town, South Africa.

Kottie's students started by taking a neighborhood walk to survey the damage of the hurricane. They also looked at photographs, read books, and experimented with a maquette complete with tiny houses and ice cubes. The maquette brought to life key ideas about the effects of causal factors that are distant in space and time, and the need for community preparedness.

Upon getting to know their "e-pals" in S. Africa, the students became increasingly comfortable communicating with their peers and sharing their emerging understandings of climate change though blogs. They discovered how their different contexts led to different proposed solutions (e.g., a surprising suggestion from a South African student was growing bamboo).

Although studying climate change can generate strong emotions such as fear, the unit purposefully ended with students brainstorming ideas for mitigation such as reducing consumption, persuading parents to buy hybrid cars, and talking to friends and family. The students formed groups which tried to reach consensus on an action they could reasonably commit to. For example, some students created an animated video, and some presented what they learned at a school-wide assembly.

[4] To read the full case see: Boix Mansilla, V., & Chua, F. S. (2017). Signature Pedagogies in Global Competence Education: Understanding Quality Teaching Practice. In *Educating for the 21st Century* (pp. 93-115). Singapore: Springer.

- **Observe & reflect:** Citizen-learners use their senses to examine objects and systems in order to notice their details and uncover their complexities. By slowing down to observe the world more carefully and listen attentively to others, citizen-learners notice similarities and differences, discern patterns, and perceive nuances (Tishman, 2018). Through individual and collective reflection, new insights emerge that shape understanding.
- **Challenge assumptions:** When outcomes do not fit expectations, citizen-learners question their assumptions and beliefs. They may revise assumptions about themselves, other people, and the world. Addressing high leverage, "bottleneck" conceptions or preconceptions about the way the world works is crucial to enabling new levels of disciplinary or interdisciplinary understanding, and for setting the stage for deeper learning (Meyer & Land, 2006; Perkins & Grotzer, 2005).
- **Engage the emotions:** The typical school curriculum often includes closed learning experiences with defined input and predictable output. Unpredictable, open-ended learning experiences that elicit a range of emotions are harder to find in the classroom. Yet when citizen-learners engage in playful inquiry and take risks, they experience powerful emotions such as awe, frustration, wonder, joy, compassion, or altruism. These emotions inspire curiosity and motivate learning.
- **Exchange & develop perspectives:** Citizen-learners recognize their own and others' perspectives, and the influences that shape them. Directly engaging citizen-learners with the ideas and ways of thinking of others enhances content learning and their understanding of other minds. Exchanging perspectives, stories, and ideas within and across cultures helps citizen-learners connect their own lives to the larger human experience (Dawes-Duraisingh et al., 2016).
- **Inquire & investigate:** Citizen-learners wonder; they pose questions and articulate their significance. They carry out research using a variety of sources and media, and build informed arguments based on evidence. They share their conclusions with others as testable theories to be examined. Seeking and offering feedback is a critical part of this process.
- **Make thinking & learning visible:** Making thinking and learning visible is key to how citizen-learners learn (Krechevsky et al., 2013; Ritchhart, Church, & Morrison, 2011). Citizen-learners make their thinking and learning visible in a variety of artifacts by regularly sharing their thoughts, questions, and observations throughout the learning process. This might take the form of post-it notes on a wall, portfolios of work-in-progress, or posting ideas on a poster or in an online forum. This visibility honors the contributions of multiple individuals; it enables them to learn from the ideas of others; and it informs and deepens future learning.

Building a Culture of Thinking Right from the Start Error! Bookmark not defined.

Leslie Revis, Beaufort High School, Spanish 3 (11th/12th grade), Beaufort, SC, USA

Leslie Revis's Spanish 3 class has had a powerful impact on the local community. The students supplied Spanish translations for all of the local agencies interested in serving the Hispanic community. They also translated evacuation notices in case of a hurricane and informational booklets for Mexican immigrants. The students felt extraordinarily proud of the work they accomplished and were stunned to discover that grown-ups found what they did valuable!

Leslie had a strong desire to create a real community in her classroom in which all her students would feel comfortable. In part, because of the large class size, Leslie set up centers with different themes and activities that would motivate both her and her students. Developing language skills became a platform for developing higher-order thinking skills and understanding on issues that she and her students cared about.

For example, one center focused on a comparative study between students' personal lives and the lives of Central American children. Students were surprised to learn that some communities had no running water, and that children were begging to go to school. The core idea underlying each center was that students begin to consider what their own lives were like, and new possibilities for the paths they might take in relation to what other people in the world were experiencing.

Leslie judged success in her classroom by the level of happiness in her students—their laughter, joy, passion for discovery, and knowledge that they could make a difference for other people.

What do citizen-learners do with what they learn?

Citizen-learners apply what they learn in new contexts. They also envision new possibilities and engage others to effect positive change in their communities in different ways. Classroom teachers might look for aspects of their subject matter that seem actionable with regard to applicability to multiple contexts, addressing a civic challenge, or imagining new possibilities.

- **Demonstrate understanding across contexts:** Citizen-learners demonstrate understanding when they apply what they know in new contexts (Blythe, 1998; Wiske, 1998). Possessing knowledge and skills is not enough; citizen learners perform or act on their understanding by going beyond the information given to create something new. They reshape, apply, expand, or build on what they already know, especially in new or unexpected settings.
- **Engage in civic dialogue:** Citizen-learners identify civic issues that matter to them and engage others in a communal exchange of ideas. They are reflective listeners. Citizen-learners share—and encourage those who are often silenced to share—stories of personal significance. They consider a broad range of strategies for making their voices heard, and for acting on civic issues in online spaces and beyond (Hodgin, James, & Shresthova, 2018).
- **Advocate & take action:** Citizen-learners champion and take action on issues of personal, local, or global significance in order to improve conditions. They identify or create opportunities for personal or group action; they assess and plan actions based on evidence and potential for impact; they act in creative and ethical ways to effect change; and they reflect on the impact of their actions and their ability to make a difference (Boix Mansilla & Jackson, 2011).
- **Envision & inspire:** Citizen-learners use what they learn to envision new possibilities and ways of thinking or living in their communities. They explore "what if" scenarios toward a more ethical present and future. They share these visions in ways that motivate and inspire others to effect positive change in the world.

Developmental Considerations

The capacities and competences of citizen-learners span age levels. Generating knowledge, for instance, is something learners of all ages participate in. Likewise, competences such as problem-finding and solving, or designing and making, can apply to students across grades and disciplines. That said, generating knowledge and problem-finding and solving will look different for different age learners. Imagining new systems or designing and redesigning objects will look different in 4th grade compared to 10th grade due to broad developmental differences. Designing a k-12 educational approach to cultivate citizen-learners entails describing how the capacities and competences develop over a learner's school trajectory. This means keeping in mind markers and trends in child and adolescent development, such as how clusters of cognitive, sensory-motor, and socio-emotional skills progress at different ages. As students grow, so do their abilities to develop autonomy, complex reasoning, physical coordination, emotional regulation, and sense of self-identity (EASEL Lab, 2020). Although seeds of these abilities are present in the early years, they grow and blossom with age and experience, revealing increasing sophistication.

Appendix B sketches a provisional table of broad developmental performance expectations for the competences of citizen-learners at late primary, middle, and high school levels. Below we describe what selected competences look like at different age levels for each capacity, drawing on the previous illustrations.

Generate Knowledge

The examples portray a range of ways students view themselves as co-creators of ideas and theories. Seeing oneself and others as *interdependent learners* both crosses and develops over age levels. In the *Nurturing Global Competence* vignette (p. 11), 4th-5th graders recognize the value of learning from other students in South Africa and, through a variety of teacher-facilitated experiences, actively co-create theories and models of global warming. In 11-12th grade, this competence becomes more self-directed and sophisticated. Students in the *Grappling with Greatness* vignette (p. 10) recognize the value that others bring to their learning (and vice-versa). They actively engage in independent writing and group discussions that create a communal context in which to debate ideas and develop the learning of individuals and the group. Similarly, seeing oneself and others as *designers & makers* involves feeling empowered to inquire through imagining, making artifacts, and building or rebuilding one's world. Students' autonomy and the impact that results from their thinking and learning will look different across age groups. The *Many Stories Library* vignette (p. 9) depicts 5th graders' understanding of what makes a "good story." With teacher scaffolding, students write their own stories of identity for a book aimed at young readers in their school and local library. The 11th-12th grade designers and makers in *Building a Culture of Thinking* (p. 12), find opportunities to better understand the experiences and needs of more complex audiences in their town—creating translations for the local hospital and police force to more effectively serve the Spanish-speaking immigrant community.

Navigate Complexity

The content, or what is learned, should matter to the lives students are likely to lead in today's (and tomorrow's) complex world. The topics and foci selected will vary depending on the age of the learner. Citizen-learners need to develop ways of thinking that are grounded in *disciplinary or interdisciplinary knowledge*—offering insight into past and contemporary phenomena and problems, such as planetary health and human rights. In the *Many Stories Library*, the concepts of stereotypes and story are explored through a literary lens, which helps to develop the learners' sense of identity. This may be some 5th graders' first encounter with abstract ideas such as identity, culture, and voice. These ideas are made concrete through well-designed learning experiences such as writing, interviewing, and drawing. In contrast, *disciplinary & interdisciplinary knowledge* will look different for older students with greater higher order abstract reasoning. In *Grappling with Greatness*, which also explores issues of stereotypes using literature as a lens, students' writings and discussions reveal a more nuanced critique in pursuit of universal "truths." Similarly, learning *ethical stances* is an important facet of what citizen-learners learn. In *Nurturing Global Competence*, 4th-5th graders develop a caring mindset by concretely connecting their personal experiences to how recent hurricane flooding affected their neighborhood. However, in *Grappling with Greatness*, 11th-12th graders wrestle internally with the confusion regarding their own beliefs about how greatness is related to more abstract concepts such as "goodness" and "morality." These examples highlight the shift from concrete to more abstract thinking across development.

Build Relationships

Relational experiences are a critical vehicle for supporting citizen-learners' own and others' learning. It is with others they develop key competences, such as how to *challenge assumptions* and *exchange & develop perspectives*. When outcomes do not fit expectations, citizen-learners reexamine their assumptions about themselves, others, and the world. By encountering others' thinking, they come to recognize their own and others' perspectives. Both competences evolve throughout childhood and adolescence. In the *Many Stories Library*, 5th graders challenge their beliefs about who they think they are through the concrete sharing of their written stories. Through the teacher's careful facilitation,

students read and discuss how stories reveal some perspectives, while ignoring others. The 11th-12th graders in *Grappling with Greatness* challenge their own and others' assumptions about "greatness," probing the experiences and forces that shape their beliefs. They engage in delicate and deliberate sharing of personal perspectives, recognizing that their views are provisional and evolving. Both the *Many Stories Library* and *Grappling with Greatness* illustrate the shift to more autonomous learning as well as complex and abstract thinking as learners develop.

Effect Ethical Change

In order for citizen-learners to apply what they learn in new contexts and make positive change in their communities, they hone the competence to *engage in civic dialogue*, which includes reflective listening, civil debate, and inviting silenced voices into their communities. In the *Many Stories Library*, 5th graders demonstrate this by identifying voices that were not represented in storybooks in their school library. They then interview family members to make their voices heard and share their stories with others. In *Grappling with Greatness*, the 11th-12th graders individually and collectively reflect on the distinctive voices in their classroom. As a community they push one another's thinking, with an eye toward enabling different voices to emerge. These two examples illustrate how the complexity and sophistication of the conversations increase throughout development. Citizen learners also *advocate & take action* based on what they learn—finding opportunities for personal or group support of causes and activities that will benefit their communities. For younger students, the impact might be more modest, such as the 4th-5th graders in *Nurturing Global Competence* advocating that their family and friends buy fewer things to cut down on waste and reduce electricity consumption by turning off lights. Older students, who may be more active in communal life, are likely to seek more ambitious results. Students in the 11th-12th grade Spanish class in *Building a Culture of Thinking* consider what other social services might be inaccessible to Spanish speakers, and who else in their community may not have access to civic supports simply because they do not speak English.

Although such finer grain descriptions at different age levels can be useful to guide educators in designing experiences for citizen-learners, we note a few cautions. *First*, when considering how to support citizen-learners, although developmental differences are important, the commonalities across age levels are equally, if not more, valuable. The questions, *Who are we as citizen-learners? What do we learn? How do we learn?* and *What do we do with what we learn?,* are accessible entry points for any age; they act as anchors throughout the arc of citizen-learners' school experience. *Second*, the descriptions of specific developmental expectations in Appendix B are provisional. More work is needed, ideally with educators in Brazil, to craft descriptive language that speaks to culturally appropriate performance expectations. *Third*, we recognize that age does not necessarily dictate ability, and that development can be fluid and variable across ages. The developmental considerations and performance expectations we outline are merely approximations. *Lastly*, operationalizing the performance expectations in the table needs to align with content. Many of the expectations in Appendix B are abstract (e.g., engage with a question, share with peers, etc.). Contextualizing the expectations will vary according to domain, such as music, environmental science, or physical education. Particularly in the early stages of conceptual development of the framework, these cautions are perhaps best addressed through close work with Brazilian educators to triangulate and refine the capacities and competences.

Conclusions and Next Steps

We have argued in this white paper that attaining excellence in education in this century requires a focus on cultivating citizen-learners of all ages who can navigate the complexities and uncertainties inherent in pursuing a more just, caring, and sustainable world. Four essential questions provide a

framework for guiding educational experiences in service of this goal: *Who are we as citizen-learners? What do we learn? How do we learn? What do we do with what we learn?* To become citizen-learners, students will need to develop key capacities such as generating knowledge, navigating complexity, building relationships, and effecting ethical change.

How should teachers organize and develop their practice to support citizen-learners? After all, teachers play a lead role in creating the conditions and experiences in which citizen-learners grow. The cases included in this paper offer some guidance. They describe educators who create cultures in their classrooms that value diverse knowers and critical and creative thinkers, that connect disciplinary and interdisciplinary topics to community needs, and that foster close observation, reflection, and the exchange of perspectives. They also show citizen-learners developing their own voice and finding value in the voices of others. Each illustration offers a window into what educators can create, often based on years of experimentation and collaboration with colleagues. They also raise important questions about the types of supports schools might offer to educators who wish to do the same.

In our next white paper, we will address the question of what a model of teacher support might look like for educators interested in cultivating citizen-learners. We will provide design principles and prototypical processes for professional development grounded in the concept that teachers, too, are citizen-learners in their community.

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Appendix A: Brazil's Basic National Core Competencies

1. **Lifelong Learning:** To value and use the historically constructed knowledge about the physical, social, cultural and digital world to understand and explain the reality, to continue learning and to contribute to the construction of a fair, democratic and inclusive society.
2. **Critical thinking:** To exercise intellectual curiosity and to resort to original approaches in sciences, including research, reflection, critical analysis, imagination and creativity; investigate causes, elaborate and test hypothesis, formulate and solve problems and create solutions (including technological ones) based on the knowledge from different areas.
3. **Aesthetic sensibility:** To value and experience diverse local and international artistic and cultural expressions, and participate in various artistic-cultural practices.
4. **Communication skills**: To use various languages—verbal (written, oral or visual-motor, as Brazilian Sign Language), physical, visual, sonic and digital—and knowledge coming from artistic, mathematical and scientific languages to express and share information, experiences, ideas, and feelings in diverse contexts and to create senses that enable mutual understandings.
5. **Digital literacy:** To understand, use and create digital information and communication technologies in a critical, significant, reflexive, and ethic manner in various social settings (including schools) to communicate, access and disseminate information, to produce knowledge, to solve problems and to be protagonist and owner of one's personal and collective life.
6. **Work and life project:** To value the diversity of knowledge and cultural experiences and to use one's own experience and knowledge to understand the specific relations of the job market and make choices in line with both citizenship values and life project, also informed by freedom, autonomy, critical thinking and responsibility.
7. **Ethics:** To argue based on facts, data and reliable information, to formulate, negotiate, and defend ideas, viewpoints and common decisions that respect and promote human rights, socio-environmental responsibility, and responsible consumption at the local, regional and global levels, in an ethical behavior towards oneself, others and the planet.
8. **Self-knowledge and self-care:** To know, appreciate and take care of one's physical and emotional health, acknowledging oneself in human diversity, and recognizing oneself and others emotions with self-criticism and ability to deal with them.
9. **Empathy:** To exercise empathy, dialogue, conflict resolution, and cooperation by making oneself respected and by promoting respect to others and to human rights, by embracing and valuing the diversity of individuals and social groups, their knowledge, identities, cultures and potentialities, and by avoiding any kind of prejudice.
10. **Citizenship**: To act personally and collectively with autonomy, responsibility, flexibility, resilience, and determination, taking decisions based on ethical, democratic, inclusive, sustainable, and solidarity principles.

Appendix B: Developmental Performance Expectations Across Primary, Middle, and High School Levels

Who are we? Citizen-learners view learning as fundamental to what it means to be human. They see themselves and others as constantly constructing, deconstructing, and reconstructing knowledge about things they care about.			
	Primary school students will...	**Middle school students will...**	**High school students will...**
Interdependent learners	… know that thinking and learning can happen both independently and with others. … believe that they can *actively* generate knowledge, both for themselves and for others. ... know the importance and benefits of learning with others, i.e., that learning with others will expand their understanding in a different way from learning on one's own. … know and value that they can learn from others in many ways or formats (e.g., talking to peers in class, learning from experts, the internet, TV, etc.).	… know that thinking and learning can happen both independently and with others, and that when one is learning with others, one is also always learning as an individual. … believe that they can and should *actively* generate knowledge, both for themselves and for others. ... know and value the importance and benefits of learning from others (i.e., that learning from and with peers and others in the local community will expand and enhance one's individual understanding). … know and value that they can learn from others in many ways or formats (e.g. talking to others inside and outside of school, learning from experts the internet, TV, etc.).	… know that thinking and learning can happen both independently and with others, and that when one is learning with others, one is also always learning as an individual. … believe that they can and should *actively* generate knowledge, both for themselves and for others, and be prepared to seek this out in their learning. ... know and value the importance and benefits of learning from and with others (i.e., that learning from and with peers and others in the local and global community will expand and enhance one's individual understanding). … know and value that they can learn from others in many ways/ formats (e.g. face-to-face interactions with others, engaging with others on digital platforms, etc.), and seek this out in their learning.
Critical & creative thinkers	… begin to develop the capacity and disposition to think creatively and critically. … know that critical thinking is analytical, evaluative, and logical in nature, and can surface details, insights, and understandings. … know that creative thinking is generative, expansive, and imaginative in nature, and can surface new insights, understandings, and possibilities. … know that dispositions (e.g. motivations, attitudes, values, and habits of mind) can play a role in their ability to think creatively and critically (e.g. motivation and habits of mind can help them think creatively and critically).	… develop and value the capacity and disposition to think creatively and critically. … know and value that critical thinking is analytical, evaluative, and logical in nature, and can surface new details, insights, understandings, and possibilities, and be motivated to think critically inside and outside of school. … know that creative thinking is generative, expansive, and imaginative in nature, and can surface new insights, understandings, and possibilities, and be motivated to think creatively inside and outside of school. … know that dispositions (e.g. motivations, attitudes, values, and habits of mind) play a role in their ability to think creatively and critically, and monitor the relationship between their dispositions and use of their critical and creative thinking capacities.	… value and expand their capacity and disposition to think creatively and critically. … know and value that critical thinking is analytical, evaluative, and logical in nature, and can surface new details, insights, understandings, and possibilities; they will be sensitive to opportunities to think critically and motivated to do so inside and outside of school. … know that creative thinking is generative, expansive, and imaginative in nature, and can surface new insights, understandings, and possibilities; they will be sensitive to opportunities to think creatively and motivated to do so inside and outside of school. … know that dispositions (e.g. motivations, attitudes, values, and habits of mind) play a role in their ability to think creatively and critically, and monitor the relationship between their dispositions and critical and creative thinking capacities, even altering their environment as needed to support use of these capacities.
Emotional agents	… know they can experience a wide range of positive and negative emotions (e.g. frustration, conflict, confusion, surprise, curiosity, empathy, joy, etc.). … recognize and name their emotions, as well as sit with and process them to better understand their own emotional state. … begin to understand that their emotional state can help regulate their behaviors and actions.	… know and accept their experience of a wide range of positive and negative emotions (e.g. frustration, conflict, confusion, surprise, curiosity, empathy, joy, etc.). … recognize, name, and respect their emotions, as well as sit with and process them to better understand their own emotional state. … understand and value that their emotional state can help regulate their behaviors and actions, contributing to their overall wellbeing.	… know and accept their experience of a wide range of positive and negative emotions (e.g. frustration, conflict, dissonance, disgust, confusion, surprise, curiosity, empathy, joy, etc.). … recognize, name, and respect their emotions, as well as sit with and process them to better understand their own emotional state, and advocate for opportunities to do so (as needed). … understand and value that their emotional state can help regulate their behaviors and actions, contributing to their overall wellbeing, and make adjustments to the environment or experience, as needed, to help regulate their emotions.

	… experience the impact of emotions on their engagement and learning. … attend to others' emotions.	… understand the impact of emotions on engagement and learning; (if applicable) begin to think about how to change the learning environment or other factors to improve their experience. … attend to others' emotions and reflect and act on that understanding (e.g. helping peers experiencing distress).	… understand the impact of emotions on engagement and learning; (if applicable) consider making adjustments to the environment or other factors to improve their experience. … attend to others' emotions and reflect and act on that understanding (e.g. helping peers experiencing distress).
Diverse knowers	… understand and value that they and those with whom they interact are culturally and cognitively diverse beings. … be able to draw on and use different ways of knowing (e.g. linguistic, logical-mathematical, spatial, musical, bodily-kinesthetic, etc.). … be able to draw on their own diverse cultural practices and experiences (e.g., discuss or suggest their own cultural games in math). … begin to express and communicate their thinking in different ways in order to deepen their own understanding and others' abilities to understand them.	… understand and value that they and others around them are culturally and cognitively diverse beings. … be able to draw on and use different ways of knowing (e.g. linguistic, logical-mathematical, spatial, musical, bodily-kinesthetic, etc.) inside and outside of school. … be able to draw on and use their own diverse cultural practices and experiences (e.g., discuss, suggest, or use their own cultural repertoire) inside and outside of school. … express and communicate their thinking in different ways to deepen their own understanding, their ability to understand others, and others' abilities to understand them.	… understand and value that they and all human beings are culturally and cognitively diverse. … be able to draw on and use different ways of knowing (e.g. linguistic, logical-mathematical, spatial, musical, bodily-kinesthetic, etc.) inside and outside of school. … be able to draw on and use their own diverse cultural practices and experiences (e.g., discuss, suggest, or use their own cultural repertoire) inside and outside of school. … actively choose different ways to represent their thinking in order to deepen their own understanding, their ability to understand others, and others' abilities to understand them, inside and outside of school.
Problem finders & solvers	… focus on solving known problems, as part of the knowledge generating process. … notice problems in their own setting that must be better understood or acted upon in order to be solved. … solve problems by considering options and constructing and enacting a plan. … begin to understand the value of slowing down and investigating different angles or assumptions before rushing to solve a potential problem.	… focus on both solving known problems and finding new problems as part of the knowledge generating process. … notice, and sometimes seek to identify, problems in their own setting that must be better understood or acted upon in order to be solved. … solve problems by considering options, and constructing and enacting a relevant plan. … understand the value of slowing down and investigating different angles or assumptions before rushing to solve a potential problem.	… focus on solving known problems, as well as identifying and understanding new problems before moving to solve them, as part of the knowledge generating process, inside and outside of school. … notice and/or seek to identify problems in and outside their own setting that must be better understood or acted upon in order to be solved. … solve problems by considering options, and constructing, enacting, and evaluating a relevant plan. … understand and enact the value of slowing down and investigating different angles or assumptions before rushing to solve a potential problem.
Designers & makers	… develop the capacity and disposition to physically shape their immediate contexts and systems through building, tinkering, re/designing, or hacking. … discern the designed dimensions of physical and conceptual systems or environments, and the potential for making them more effective, ethical, or beautiful. … be able to imagine and construct artifacts based on their interests and passions, as well as appreciate artistic and cultural activities, artifacts, and experiences.	… develop and value the capacity and disposition to physically shape their immediate and broader contexts and systems through building, tinkering, re/designing, or hacking. … discern the designed dimensions of physical and conceptual systems or environments, and consider how to make them more effective, ethical, or beautiful. …both imagine and construct artifacts based on their interests, passions, or goals, as well as value and appreciate artistic and cultural activities, artifacts, and experiences.	… value and act on their capacity and disposition to physically shape their immediate and broader contexts, systems, and world through building, tinkering, re/designing, or hacking. … discern the designed dimensions of physical and conceptual systems or environments, and feel empowered to make them more effective, ethical, or beautiful. … imagine and construct artifacts, based on their interests, passions, or goals, as well as value, appreciate, and seek out artistic and cultural activities, artifacts, and experiences.

What do we learn? Citizen-learners learn meaningful content that will allow them to understand and navigate complexity in an unpredictable world over the course of a lifetime.			
	Primary school content will...	**Middle school content will...**	**High school content will...**
Disciplines & interdisciplines	… include a focus on topics within or across disciplines. … offer students disciplinary lenses to begin to examine complex phenomena, questions, and problems to develop their understanding. … allow multiple entry points that invite students into the disciplines. … offer disciplinary insights into current challenges such as the water shortage and child labor.	… include a focus on the disciplines and sometimes interdisciplinary content. … offer students disciplinary lenses to examine complex phenomena, questions, and problems to develop their understanding within or across disciplines. … allow multiple entry points that invite students into the disciplines and interdisciplines. … offer disciplinary and cross-disciplinary insights into current local and global challenges such as human rights, social justice, and the persistence of poverty.	… include a focus on the disciplines and interdisciplines. … offer students disciplinary lenses and tools to examine complex phenomena, questions, and problems to develop their understanding within and across disciplines. … allow multiple entry points that invite students into the disciplines and interdisciplines, and encourage students to suggest additional entry points. … offer disciplinary and cross-disciplinary insights into current local and global challenges (e.g. human rights, global warming, persistence of poverty, etc.).
Ethical stances	… encourage students to examine issues or scenarios that allow them to puzzle over and develop views on ethical concepts such as what is good, moral, and just. … connect ethics to students' personal interests or local matters. … offer students the opportunity to connect with or observe role models (from the local community). … enable students to explore and develop ethical, humane, and caring mindsets, and to reflect on the impact of their actions on their local community and peers.	… encourage students to examine complex issues or scenarios that allow them to puzzle over and develop views on concepts such as what is good, moral, and just (e.g. what is the common good?). … connect ethics to students' personal interests and/or local matters. … offer students the opportunity to connect with or observe role models (from local or broader community, a role model of the student's choosing, etc.). … offer students complex issues or scenarios to explore and to develop ethical, humane, and caring mindsets, and to reflect on the impact of their actions on their community, peers, and others.	… encourage students to examine complex issues or scenarios that allow them to puzzle over, develop, and share their views on concepts such as what is good, moral, and just (e.g. how does the concept of borders either help or hurt humanity?). … connect ethics to students' personal interests and local/ global matters. … offer students the opportunity to observe, connect with, and potentially receive mentorship from role models (from local or broader community, a role model of the student's choosing, etc.). … offer students complex issues or scenarios (from local or global contexts) to explore and to develop ethical, humane, and caring mindsets, and to reflect on the impact of their actions on their community, peers, and others.
Actionable content	… inform effective action that relates to students' lives and personal or local contexts (e.g. contributing to a local cause). … offer students opportunities to develop and act in accordance with their passions, values, or beliefs. … offer concrete connections to significant local events or contexts (e.g. a local theater, the school playground, a construction site, a fire station, etc.).	… inform effective action that relates to students' lives and personal or community contexts (e.g. contributing to a local cause, developing a position on climate change or energy conservation). … offer students opportunities to develop and act in accordance with their passions, values, or beliefs. … offer concrete connections to significant local, regional, or national events or contexts (e.g. a local business, a construction site, the newsroom, etc.).	… inform effective action that relates to students' lives and personal, community, or larger contexts (e.g. contributing to a local cause, developing a position on climate change or energy conservation). … offer students opportunities to develop and act in accordance with their passions, values, or beliefs, and to advocate for such learning experiences. … offer concrete connections to significant local, regional, national, or global events or contexts (e.g. local or national businesses or organizations, climate change, etc.).
Meaningful topics	… encourage students to invest in the learning process by inviting them to explore their own interests, values, goals, and motivations (offering student choice and voice). … enable students to connect their own interests, values, goals, and motivations to the shared values or interests of their peers and local community.	… encourage students to invest in the learning process by inviting them to explore their own interests, values, goals, and motivations, and solicit student suggestions of learning opportunities or experiences. … enable students to connect their own interests, values, goals, and motivations to the shared values or interests of their peers, local, and broader community, and reflect on those connections.	… encourage students to invest in the learning process by inviting them to explore their own interests, values, goals, and motivations, and solicit student suggestions of learning opportunities or experiences. … enable students to regularly connect their own interests, values, goals, and motivations to the shared values or interests of their peers, and local, national, or global community, and reflect on those connections.

	… provide opportunities for students to participate in and see themselves as belonging to something bigger than themselves.	… provide opportunities for students to participate in and belong to something bigger than themselves.	… provide opportunities and solicit ideas from students to participate in and belong to something bigger than themselves.
Lifelong practices	… support understandings that are likely to inform students' thinking and actions over their lifetime. … offer opportunities that connect to a variety of contexts that students are likely to encounter throughout their lives (e.g. maintaining and negotiating relationships). … highlight *why* certain knowledge and actions will be useful for living and participating in a community.	… support understandings that are likely to inform students' thinking and actions over their lifetime. … offer opportunities that connect to a variety of contexts that students are likely to encounter throughout their lives (e.g. maintaining and negotiating relationships, understanding a news story, etc.). … highlight *why* certain knowledge and actions will be useful for living and participating in a community. … allow students to consider and suggest lifelong practices that relate to their own interests and goals.	… support understandings that are likely to inform students' thinking and actions over their lifetime. … offer opportunities that connect to a variety of contexts that students are likely to encounter throughout their lives (e.g. maintaining and negotiating relationships, understanding a news story, making a healthcare decision, etc.). … highlight *why and how* certain knowledge and actions will be useful for living and participating in a community. … allow students to consider and suggest lifelong related to their interests and goals.

How do we learn? Citizen-learners learn by observing, reflecting, inquiring, and investigating; they develop and share ideas and theories to support their own and others' learning.			
	Primary school students will...	**Middle school students will...**	**High school students will...**
Observe & reflect	… use their senses to observe the details of objects and systems when prompted by the teacher. … observe slowly and carefully to identify similarities, differences, and patterns among objects and systems, when prompted by the teacher. … reflect individually and with others to deepen understanding when prompted by the teacher.	… use their senses to observe the details and complexities of objects and systems when prompted by the teacher and on their own. … observe slowly and carefully to identify similarities, differences, patterns, and nuances among objects and systems when prompted by a teacher or on their own. … reflect on their own thinking and with others to deepen understanding, with and without prompting by a teacher.	… use their senses to observe the details and complexities of objects and systems on their own. … observe slowly and carefully to identify similarities, differences, patterns, and nuances among objects and systems when prompted by a teacher and on their own. … regularly reflect on their own and with others to deepen understanding without prompting from a teacher.
Challenge assumptions	… challenge fundamental assumptions or preconceptions about everyday phenomena or beliefs through teacher-facilitated experiences and discussion. … begin to reflect on and explain dissatisfaction, as well as why it may not fit with prior assumptions.	… challenge fundamental assumptions about everyday phenomena or beliefs, through physical manipulation, abstract thought, reflection, and teacher-facilitated discussion. … express and explain dissatisfaction and consider possible new explanations.	… challenge fundamental assumptions about everyday phenomena, beliefs, and the world more generally, through physical manipulation, abstract thought, reflection, and discussion with others. … express and explain dissatisfaction and consider possible new explanations.
Engage the emotions	… engage in playful inquiry that elicits emotions and motivates learning (e.g. by participating in open-ended learning experiences). … experience and recognize powerful emotions during the learning process (e.g. frustration, awe, surprise, etc.). … pursue moments of curiosity and motivation during learning experiences.	… take playful risks that engage the emotions, e.g., by participating in open-ended, unpredictable learning scenarios. … experience and navigate powerful emotions during the learning process (e.g. frustration, awe, surprise, etc.). … pursue moments of curiosity and motivation during learning experiences; may advocate for learning experiences that inspire these emotions.	… pursue opportunities to take playful risks that engage the emotions, e.g., by participating in open-ended, unpredictable learning scenarios. … experience and navigate powerful emotions during the learning process (e.g. frustration, awe, surprise, etc.); seek out experiences that inspire wonder and awe … pursue moments of curiosity and motivation during learning experiences, and advocate for learning experiences that inspire these emotions.
Exchange & develop perspectives	… consider the ways of thinking of others when developing their own ideas and beliefs … share their own stories and perspectives and listen to those of others.	… consider the ways of thinking of others, within and across cultures, when developing their own ideas and beliefs. … critically reflect on their own stories and perspectives and those of others to deepen understanding.	… consider the ways of thinking of others, within and across cultures, when developing their own ideas and beliefs. … critically reflect on their own stories and perspectives in order to understand why they may hold these perspectives, and to connect their own lives to the larger human experience.

	… begin to identify factors that influence their own perspectives.	… identify factors that influence their own and others' perspectives. … engage in purposeful and respectful dialogue with the goal of developing their own and others' perspectives.	… identify factors that influence their own and others' perspectives. … regularly engage in purposeful and respectful dialogue with the goal of developing their own and others' perspectives and deepening understanding of human nature.
Inquire & investigate	… pursue a question or line of inquiry (suggested by the teacher or self-identified). … develop hypotheses and collect evidence to construct claims during the investigation. … use a variety of sources or media to carry out research and share findings during and after the investigation. … share potential theories and expand or modify their inquiry based on feedback from others. … consider potential bias impacting their inquiry and findings, when prompted by the teacher.	… formulate their own questions to investigate based on what they're learning in class or their own interests. … plan their investigation. … develop (and redevelop) hypotheses during the investigation. … interrogate and gather evidence from multiple sources to inform their findings during the investigation. … use different media to share what they learned. … share potential theories and expand or modify their own inquiry based on feedback from others. … consider possible bias impacting their inquiry and findings, when prompted by the teacher and/or on their own.	… formulate their own questions to investigate. … plan and document the processes involved in their investigation. … formulate (and reformulate) hypotheses during the investigation. … gather evidence from multiple sources to inform their findings during the investigation. … interrogate the validity and reliability of evidence to strengthen their claims during the investigation. … share potential theories and modify inquiry based on feedback from others. … use different media to share findings. … consider possible bias impacting their inquiry and findings, when prompted by the teacher and on their own. … propose future steps for inquiry.
Make thinking & learning visible	… make their thinking and learning visible by sharing their ideas, questions and observations throughout the learning process, with support from the teacher. … make their thinking and learning visible by creating artifacts (e.g. process-folios, posting ideas on post-its, etc.). … revisit documentation of their own and others' thinking in order to enhance learning.	… make their thinking and learning visible by sharing their ideas, questions and observations throughout the learning process, with occasional support from the teacher. … make their thinking and learning visible by creating physical and/or digital artifacts (e.g. process-folios, posting ideas on post-its, an online forum, etc.). … revisit documentation of their own and others' thinking in order to reflect, build on, or challenge that thinking.	… make their thinking and learning visible by sharing their ideas, questions and observations throughout the learning process without prompting. … regularly make their thinking and learning visible by developing physical and/or digital artifacts (e.g. process-folios, posting ideas on posters, an online forum, etc.). …. Revisit documentation of their own and others' thinking to reflect, build on, or challenge that thinking, and to reflect on how they and others learn.

What do we do with what we learn? Citizen-learners apply what they learn in new contexts; they inspire and engage others in taking civic action in a variety of ways.			
	Primary school students will...	**Middle school students will...**	**High school students will...**
Demonstrate understanding in & across contexts	… apply what they learn in a new yet related context (near transfer), particularly when prompted by the teacher. … demonstrate their understanding by solving a problem, making a product, etc. … demonstrate their understanding by making or doing something *new* that builds on what they already know.	… apply what they learn in a new context (e.g., apply previously learned math skills to constructing a model for an engineering project), when prompted by the teacher or on their own. … regularly demonstrate their understanding by solving a problem, creating a product, etc. … demonstrate their understanding by making or doing something *new* that reshapes, expands, or builds on what they already know.	… apply what they learned in a new context, and suggest new contexts in which to apply their learning. … regularly demonstrate their understanding by solving a problem, creating a product, etc., and appreciate that understanding is not something one "has," but rather one has to "do" something with one's knowledge in order to demonstrate understanding. … demonstrate their understanding by making or doing something *new* that reshapes, expands, or builds on what they already know.
Engage in civic dialogue	… share ideas, feelings, and beliefs about a civic issue with others. … recognize that some voices are often silenced or underrepresented and listen to these voices. … identify and use at least one strategy for making voices heard (e.g. digitally, writing, speaking, etc.).	… share ideas, feelings, and beliefs about a civic issue with others. … identify and listen to voices that are often silenced or underrepresented. … identify and use several strategies for making voices heard (e.g. digitally, on online forums, writing, speaking, etc.).	… share ideas, feelings, and beliefs about a civic issue with others. … identify, seek out, and listen to voices that are often silenced or underrepresented. … identify and choose from multiple strategies for making voices heard (e.g. digitally, on online forums, writing, speaking, public engagements, etc.).

Advocate & take action	… champion and take action on an issue or cause of personal or local significance, with support from the teacher. … suggest potential action steps, begin planning, and take positive action individually or with others. … reflect on their role and ability to make a difference.	… champion and take action on an issue or cause of personal or local significance based on their own interests or a topic proposed by the teacher. … propose, plan (using evidence and ethics), and take positive action individually and/or with others. … consider local organizations to partner with to make change in the community. … reflect on their role and ability to make a difference. … propose ways to stay involved in advocacy.	… champion and take action on an issue or cause of personal, local, or global significance based on their own interests. … propose, plan (using evidence and ethics), and engage in positive action individually and with others. … partner with local, national, or global organizations to make change in the broader community. … reflect on their role and ability to make a difference. … propose ways to improve their advocacy efforts in order to continue contributing to positive change.
Envision & inspire	… imagine new possibilities or ways of thinking or interacting based on what they're learning in class. … consider "what if" scenarios for a more ethical life and future, with support from the teacher. … share new visions with peers and adults in order to inspire them to act more ethically and effect positive change.	… imagine and suggest new possibilities or ways of thinking or living based on what they're learning in class or their own interests or passions. … consider "what if" scenarios for a more ethical life and future, with support from the teacher or on their own. … share new visions with peers and others in the local community to inspire them to act more ethically and effect positive change.	… imagine and suggest new possibilities or ways of thinking or living based on current events, their own interests, and/or on behalf of others. … consider "what if" scenarios for a more ethical life and future for their own community and/or globally, and create artifacts (e.g. posters, presentations, etc.) that depict their visions. … share new visions in order to inspire community members locally and possibly globally (e.g., via the internet) to act more ethically and effect positive change.