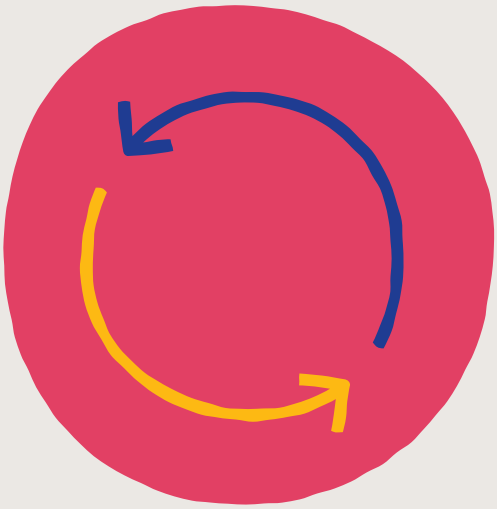

# Digital play for global citizens

A guide from the Joan Ganz Cooney Center at Sesame Workshop

By Jordan Shapiro
Foreword by Tony Jackson, Asia Society

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the Joan Ganz Cooney Center at Sesame Workshop
advancing children's learning in the digital age

sesameworkshop

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The mission of the Joan Ganz Cooney Center is to foster innovation in children's learning through digital media. The Cooney Center catalyzes and supports research, development, and investment in digital media technologies to advance children's learning and is committed to the timely dissemination of useful research. Working closely with its fellows, national advisors, media scholars, and practitioners, the Center publishes industry, policy, and research briefs examining key issues in the field of digital media and learning.

Sesame Workshop is the nonprofit media and educational organization behind Sesame Street, the pioneering television show that has been reaching and teaching children since 1969. Today, Sesame Workshop is an innovative force for change, with a mission to help kids everywhere grow smarter, stronger, and kinder. We're present in more than 150 countries, serving vulnerable children through a wide range of media, formal education, and philanthropically-funded social impact programs, each grounded in rigorous research and tailored to the needs and cultures of the communities we serve. For more information, please visit sesameworkshop.org.

The Center for Global Education at Asia Society partners with education leaders and institutions from the US, Asia, and around the world to tackle one of the most critical education challenges today: how to educate all students for employability and citizenship in a global era. Our mission is to develop global competence in students and educators as the foundation for understanding between people in the Asia Pacific region and throughout the world. We accomplish this by working with educators, school districts, parents, and communities to ensure they have the tools and support they need to add a global dimension to learning and prepare young people for our global future.

A full-text PDF of this report is available as a free download from www.joanganzcooneycenter.org.

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# foreword

Sesame Workshop has for decades been one of the world's leading organizations in developing children's capacity for understanding and friendship across cultures. In 2017, Asia Society honored these efforts by recognizing the Workshop through its Asia Game Changers Awards. I've visited Sesame Workshop's studios in India to see firsthand how deep knowledge about children's development is creatively transformed into a global public good. I'm honored to introduce you to this new publication from the Joan Ganz Cooney Center at Sesame Workshop, *Digital Play for Global Citizens*.

*Digital Play for Global Citizens* is an excellent introduction to how educators and parents can use a multitude of innovative technology tools to help their students and children learn about, understand, and engage with our increasingly interconnected world. Educating students to become "macro-minded" global citizens, as Jordan Shapiro puts it, empowers them to embody the essential tenets of global competence—the ability to investigate the world, recognize perspectives, communicate ideas, and take action—in a manner that is fun, engaging, and synchronized with our fast-paced, technologically advanced 21st century.

Divided into three parts, *Digital Play for Global Citizens* introduces tools to help students build awareness of themselves and the world around them, recognize and investigate the complex and systemic causes of events across cultures and history, and use digital play to explore the natural world. From exploring boundaries, borders, and geography in context to developing empathy and understanding of diversity; from investigating the systemic causes of economic injustice to developing a sense of curiosity and wonder about nature; Shapiro introduces tools and techniques for using digital play to develop all aspects of global competence.

I know you'll find the resources and ideas here to be as engaging and innovative as I did, and I hope *Digital Play for Global Citizens* inspires you to go a step further and develop your own creative ideas to engage your own future macro-minded citizens with the world.

**Tony Jackson**
*Vice President of Education, Asia Society*
*Director, Center for Global Education at Asia Society*

# introduction

*The future is already here.*
We are now living, learning, and teaching in a connected world. And it's not just the technology. Yes, digital tools bring us together: they allow us to communicate in spectacular ways. But they represent only one example of the "networked" phenomenon. There's also globalization, worldwide economic interdependence, faster transportation, migration, urbanization, and more.

*We have all become global citizens of a connected world.*
Now, everyone needs to cultivate a capacity for connected thinking. To live and thrive in the 21st century, today's children require more than just the ability to operate the tools of the times. They also need to develop the dispositions, knowledge, and skills required to understand the world, to make sense of how a globalized economy shapes their lives, and to consider how they can contribute to a worldwide community.

*This guide can help grownups prepare children for tomorrow.*
Adults can leverage connected tools to create opportunities for meaningful digital play. Using the platforms and technologies that kids already love, teachers, parents, and caregivers can introduce young people to some of the most complex geopolitical, economic, and environmental issues that shape our world.

**We can nurture macro-minded citizens who are ready to live productive, engaged, and fulfilled lives in a globalized world.**

**macro-minded**
**The prefix *macro* comes from the ancient Greek μακρο, which originally meant long or large. In the 20th century, it was often used to mean "comprehensive." People spoke of things being "macroscopic." And "macroeconomics" became a general term describing the field of scholarship which looks at large-scale economic factors. Here, we use the term "macro-minded" to denote the habits of mind that are associated with a world-wide outlook. Global citizens should be macro-minded; they should be inclined to consider how extensive international factors shape and contribute to a broad set of issues.**

**further reading**

**Kate Anderson & Jasodhara Bhattacharya, *Measuring Global Citizenship Education: A Collection of Practices and Tools* (Washington, DC: Brookings Institute, 2017).**

**Veronica Boix Mansilla & Anthony Jackson, *Educating for Global Competence: Preparing Our Youth to Engage the World* (New York: Asia Society, 2011).**

**OECD/Asia Society, *Teaching for Global Competence in a Rapidly Changing World* (2018).**

**Fernando Reimers, Vidur Chopra, Connie K. Chung, Julia Higdon, & E. B. O'Donnell, *Empowering Global Citizens: A World Course* (CreateSpace Independent Publishing Platform, 2016).**

**Selections from *Meaningful Education In Times of Uncertainty: A Collection of Essays from the Center For Universal Education* (Washington, DC: Brookings Institute, 2017):**

- **George Papandreou & Jordan Shapiro, "An Ancient Education for Modern Democracy and Global Citizenship."**
- **Julia Gillard, "Sharing the Future by Building Better Education Systems."**
- **Fernando Reimers, "Rediscovering the Cosmopolitan Moral Purpose of Education."**
- **Seamus Hagarty, "A Curriculum for Our Time."**

# 1 understanding self and other

Since ancient times, people have struggled to understand "the self." The connected world presents a new context for this age-old philosophical enigma. Today's kids need grownups to help them make sense of a networked existence, and that involves deciphering the primordial puzzle of "the self."

Think about this: if everything is always changing, how can a person remain the same? How do we maintain our cohesive sense of identity?

We interact with different friends, change schools, buy new styles of clothing, engage in unfamiliar activities. These things all mold us. But nevertheless, we remain ourselves. Bodies grow, skin cells shed, teeth fall out, hair turns gray. Physical traits transform throughout our lives, yet I know that I am still the same *me* that I have always been. How can that be?

**the self**

**One of the earliest theories of the *self* comes from the pre-Socratic philosopher Pythagoras. Living on the island of Samos around 530 BCE, Pythagoras believed in a soul which existed prior to the body. The ancient Greek word for soul is *psyche* (ψυχή), which is where we get the modern terms *psychology* and *psychiatry*. Pythagoras's concept of the soul may have had a lot in common with what we currently call the *mind*, the *personality*, or *consciousness*. His ideas influenced Plato, and then St. Augustine. Hence, the spiritual *soul* of the Abrahamic religions may be derived from Pythagoras's belief in rebirth or reincarnation—the idea that there's a persistent *self* that draws from a divine realm and transcends the limitations of the earthly world.**

What is this part of myself that stays put even as everything around it transforms? Philosophers have speculated about this for almost three millennia. Concepts like the soul, the spirit, and consciousness try to explain why we experience a coherent and cohesive sense of self despite living in a constantly changing world.

Additionally, many of humanity's greatest thinkers have pointed out that a sense of self depends on one's ability to recognize an "other." After all, I only know what's me because I know what's not. You're not me. A turtle is not me.

Psychologists and social scientists speculate that nationalism, tribalism, racism, and isolationism are all unconscious attempts to strengthen a threatened sense-of-self by identifying an exaggerated caricature of the "other." Like girls who put a sign on the ladder up to their treehouse—NO BOYS ALLOWED!!!!—communities sometimes construct walls that aim to reinforce what belongs and what doesn't. When girls keep the boys out, they are embracing a gender identity. When nations keep their neighbors out, they are embracing a geographical sense of identity.

All people need a strong sense of self and, therefore, a reasonable understanding of what's other. But division and isolation don't fit very well into a connected world. That's why teachers, parents, and caregivers need to help kids develop a sense of identity—one in which "self" and "other" are articulated in healthy and productive ways. Without guidance and mentorship, identity can too easily be fortified and expressed through hate, prejudice, or violence.

**People often think that isolationist tendencies arise because of a lack of exposure to diversity. But this is not the case. In fact, it is exposure to diversity, without guidance or education, that causes people to experience a *crisis of identity*. Without help, folks can easily end up addressing a crisis in problematic ways. The word *crisis* describes the need to make a judgement, a decision, or a choice—it refers to the moment when one faces a diverse set of seemingly incompatible factors and struggles to find a way to resolve the tension. If you never experienced multiplicity, you'd never have to make a choice. Hence, a lack of diversity feels stable and safe. In a connected world, however, we're all faced with a dizzying and disorienting amount of exposure to a variety of diverse ideas, people, and cultures. We need teachers and mentors to help us find complex and compassionate solutions to the crises which threaten our sense of identity.**

We're quickly discovering that a networked world presents a new set of challenges around identity formation. One reason for this is that global interdependence and the digital web bring exposure to an onslaught of ideas, people, and images. In a networked world, the ability to cultivate a healthy sense-of-self becomes more tenuous than ever.

Kids need your help. Teach them to leverage the tools of the times in ways that promote a meaningful sense of identity.

Teach them how to use new media to articulate their unique sense of self while simultaneously sustaining the dignity and value of global difference and diversity.

Teach them to be fulfilled citizens of a connected world.

### start here

**Most of the resources in this guide are suggested for children ages 8 and older. In some cases, however, they can deal with potentially disturbing themes, which means they may only be appropriate for older children. Usually, it's not the game that's problematic, but rather the uncomfortable subject matter. Therefore, grownups will need to use their own discretion. For example, if your child is not ready to think about the realities of human trafficking, your child is also not ready to play a game about it.**

**We strongly encourage grownups to play the games in this guide before introducing any of them to young people. Then, play along with your students and children. Decades worth of research have demonstrated the benefits of joint media engagement. Playing together not only provides opportunities for additional conversation about the game's themes, but also it helps kids develop the habit of thinking critically about all the digital media they consume.**

**Whenever possible, we have provided some suggested websites and apps for younger (5+) and the youngest (preschool) children in sidebars throughout this guide.**

**We have also linked directly to the resources mentioned throughout this guide. Most are free, but those that are not are marked with ($).**

# you are here: borders, boundaries, and geography

Sometimes, during a geography lesson, we get caught up in memorizing place names. We recognize where the border lines are drawn. We identify major bodies of water, mountain ranges, deserts, and jungles. But we forget to help our students understand geography in the context of their lived experiences.

### beyond borders

**According to the *Oxford English Dictionary*, geography describes "the field of study concerned with the physical features of the earth and its atmosphere, and with human activity as it affects and is affected by these, including the distribution of populations and resources and political and economic activities." And yet, school often makes it all about maps, forgetting to include lessons about the human activities. Global citizens need to know about more than just the borders and boundaries. We need to teach them to understand the people, the cultures, and the economic factors as well.**

Geography lessons can offer opportunities for kids to establish a sense of place. Let young people know where they are, and let them discover how their location relates to people in other parts of the world.

We've come a long way from *Where in the World is Carmen Sandiego?* There are now many playful digital tools available for learning geography. Some of my favorites use Google's Street View as the foundation. GeoGuessr and EarthPicker are good examples. Players are presented with random street-view images. And they're asked

to try to pinpoint the location of the picture on a map. It's not easy. My success rate is only about 65 percent.

But games like these are not about arriving at the correct answers. That's why they tend to be most effective when played in small groups or as a full class activity: the real learning comes from discussing the clues. Together, groups can look at street signs printed in foreign languages and try to identify the origin of the alphabet. Is it Greek? Hebrew? Japanese?

They can discuss the flora and fauna, identifying the ecosystems of different climates. Tropical? Mountain? Desert?

They might even recognize distinct cultural markers like clothing or methods of transportation. Is that a tuk-tuk? A funicular? A dhow boat? A coco-taxi?

With a well-facilitated discussion, maybe even some strategic Internet searches, these activities can add an enormous amount of richness and depth to a classroom lesson, introducing ideas about diversity, economic resources, language, and earth science.

For more independent play, a game like *Where in the World?* features curated images of famous places. And *SmartyPins*, from Google, combines trivia questions with a map pinning challenge. Because these two games are timed—players race against a clock—they're not great for class discussion. But they offer opportunities for students to practice thinking about their place in a much larger world.

The key point is that global citizenship starts with global awareness—not only awareness that other places exist, but also an appreciation of the landmarks and physical spaces that make a place unique.

When young people have opportunities to explore otherness in a guided way, with a teacher or a mentor who models a respectful curiosity, they learn not only the value of being *macro-minded*, but also, they come to see the Internet as a portal to faraway cultures. Exposure and access to otherness becomes meaningful and constructive.

**Google Maps includes over 20 petabytes of data (about 21 million gigabytes). Satellite technology makes it possible for us to consider cartography in ways we never could before. In 2005, it helped scientists discover a previously unmapped rainforest on Mount Mabu in Mozambique; it's now colloquially called "Google Forest."**

**The technology is amazing, but it can sometimes be problematic. In 2010, Google Maps accidentally depicted an incorrect border, making it look as though Nicaragua had invaded Costa Rica. In response, troops actually crossed the border and changed the flags. The conflict was quickly resolved. But there are places where borders remain in dispute and nowadays, in order to avoid similar geopolitical tensions, Google shows different maps depending on the location from which one browses the web.**

**for younger children**

**National Geographic Kids offers tons of great resources, including the Hello World Memory game, in which users match flags to greetings in different languages, and Explore the World!, an interactive map that features facts about countries all over the world.**

# unfamiliar places: field trips for a connected world

As today's kids grow up to become 21st century adults, they are likely to face many adaptive challenges. They will transition among many different job types, draw professional contacts from a variety of networks, and they will face a rapidly shifting set of options, choices, and uncertainties.

**The U.S. Bureau of Labor Statistics estimates that the average American worker holds 10 different jobs before the age of 40. That number is projected to increase. The idea of having a job-for-life or a single long-term career has been replaced with what psychologists and sociologists call "short-termism." Anthony Elliot, professor of sociology at the University of South Australia, worries about the impact of constant reinvention. He writes:**

> **The 21st century craze to constantly reinvent identities is fast becoming integral to contemporary living, and oftentimes involves a "tipping point" into addictions, obsessions and compulsions. Today this is nowhere more evident than in the pressure consumerism puts on us to "transform" and "improve" every aspect of ourselves: not just our homes and gardens but our careers, our food, our clothes, our sex lives, our faces, minds, and bodies.**

**A generation of global citizens will need to have the capacity to deal with adaptive challenges, to undergo a healthy process of self-reflection and exploration, without feeling compelled to completely reinvent themselves each time.[1]**

In order for them to develop a sense of stability, it is absolutely essential that teachers, parents, and caregivers help children build the capacity for healthy exploration, reflection, and articulation of the self. Education researchers Hanoch Flum and Avi Kaplan define exploration as "a deliberate internal or external action of seeking and processing information in relation to the self." And they recommend that educators think of all teaching as a process of "eliciting, affording opportunities for, and scaffolding students' exploration."[2]

What happens when we combine this way of thinking with digital pedagogies? How can grownups mentor kids as they leverage digital technologies built for exploration? Perhaps we can start with an inexpensive virtual reality headset like Google Cardboard. Use Expeditions or DiscoveryVR to take a field trip without ever leaving the familiarity of the classroom or the comfort of home.

Of course, it's not exactly the same as being there in person. VR experiences are subjective rather than objective. But for aspiring global citizens, many of the educational benefits remain intact. After all, a field trip is not just about being some place. It's about exploration: making sense of the self in a new context. A field trip, in either the virtual or the physical world, is special because it lets children practice orienting themselves to unfamiliar places.

[1] Anthony Elliott, *Identity Troubles: An Introduction* (London: Routledge, 2016).
[2] Hanoch Flum and Avi Kaplan, "Exploratory Orientation as an Educational Goal," *Educational Psychologist* 41, no. 2 (2006): 99–110.

Teachers or mentors can use exploration to promote global citizenship by facilitating discussions. In other words, don't ask kids simply to describe the things they've seen, but rather to explain how the things they discovered relate to their sense of identity. Ask them how they feel about the places in which they've been immersed. Ask: Do they remind you of places you've been? Are there friends or family members that you'd like to take with you if you went in real life? How would you talk to the other people you saw there? How was the place you visited similar or different from a place where you spend a lot of time?

**Before going on a virtual field trip, let kids research facts and figures about the foreign place they plan to visit. They can use an online reference like the CIA's World Factbook. It catalogs everything anyone ever wanted to know about another nation in one easy to navigate place. Let your students take those facts and use them to become more connected and engaged global citizens.**

When these kinds of questions are paired with early classroom experiences, it helps kids cultivate habits of mind that they can draw on when facing adaptive challenges in the future. Perhaps that's why Flum and Kaplan suggest that the primary focus of all educational activities should be for students "to intentionally and consciously examine, investigate, and evaluate the relevance and meaning of content and action to their sense of who they are and who they want to be."

Well-constructed learning activities constantly provide opportunities for exploration and self-reflection.

## identity & expression: articulating stories of the self

Few things are as important to a global citizen as learning that academic content and traditional knowledge are cognitive tools with which to productively express one's identity. There are thousands of digital platforms that enable students to practice creating playful content which tells a unique story.

First, consider the popular drag-and-drop coding platform Scratch. People usually think of it as a way to introduce computer science skills, build digital animations, and program video games. But when it comes to global citizenship, what makes Scratch powerful is the way it lets kids use algorithmic thinking to express themselves.

Digital play should always encourage kids to perceive the technologies of a connected world as instruments they can command—not boxes which distribute content to be consumed, or rigid systems that confine the shape of their communications. Children need to learn that the computer is a tool for creative self-expression, an opportunity to articulate a narrative of the self.

Why not introduce them to a tool like Microsoft's Remix3D? It allows kids to become digital artists. Starting with simple templates, they drag, drop, stretch, rotate, augment, and shrink objects in three dimensions. Students can manipulate objects and express their creative sensibility in magical ways that used to be only available to the engineers who programmed special effects and produced animated films.

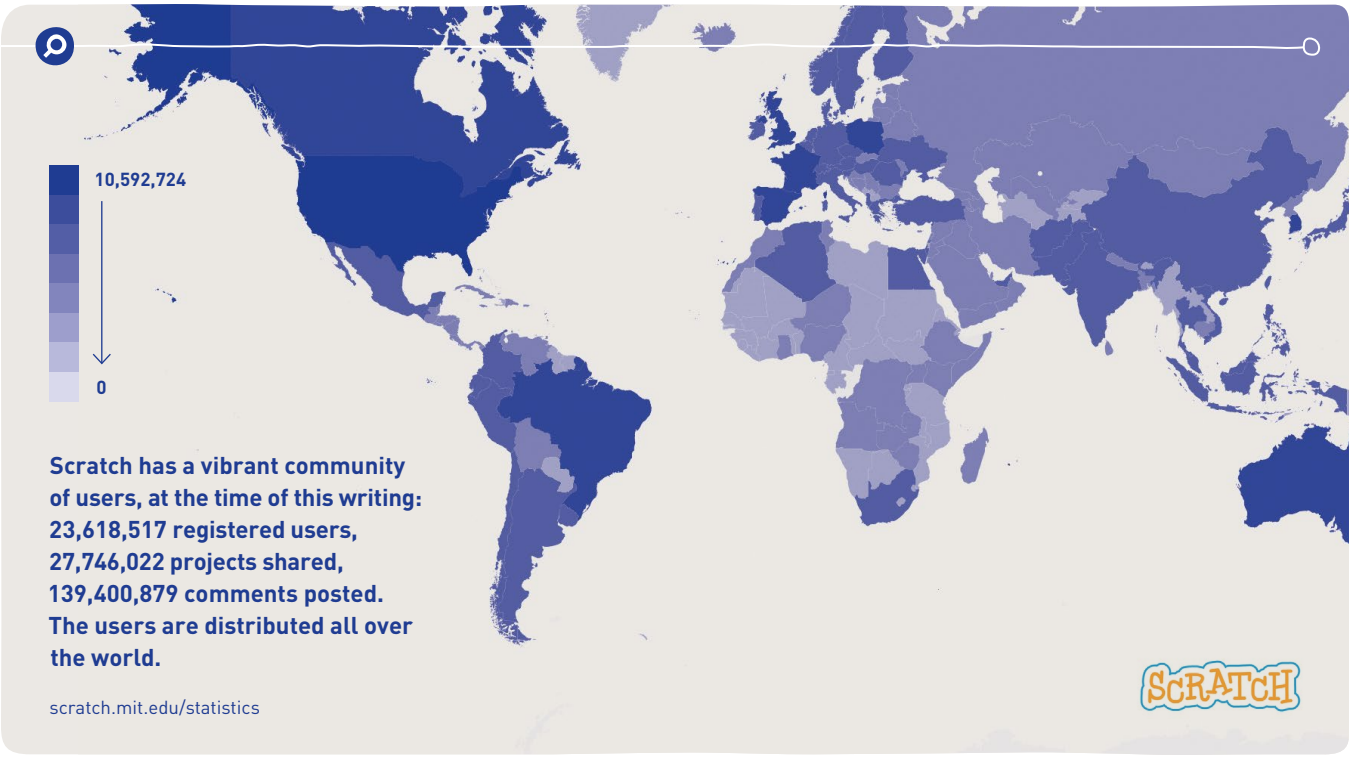
Kids can also use everyday devices to create augmented reality experiences. With a simple webcam, tablet, or smartphone they can position their virtual 3D creations in the material world, assembling images that seem lifelike. And if that's not enough, let kids bounce creatively between PC-based programs like Remix 3D, Paint 3D, and 3D Builder. There are also web-based apps like Tinkercad or SketchUp. They can export the whimsy of their imaginations to the filament of a 3D printer.

The 3D printing projects coming out of today's maker labs are nothing short of amazing. But it's not just because tinkering provides an opportunity for hands-on and project-based learning. It's also about children's ability to articulate narratives of the self. With augmented reality and 3D printing, kids are learning that they can take the craziest creatures from their imaginations and turn them into tangible objects with which to interact with their surroundings.

**Perhaps you're overwhelmed by the complexity of coding and 3D modeling. Don't fret. Learning to be a productive contributor to a global economy doesn't have to involve grand spectacle.**

**Some apps were originally built for creating content for social media. Tools like Adobe Spark and Sprightly make it easy for kids to create their own impressive animated slide shows, GIFs, and photo collages—complete with music, subtitles, and narration. Show kids that they have the power to create the content they usually consume.**

The 3D printed objects lifted from a heated print-bed should be seen as the finger-paintings and sand castles of the 21st century, laying the foundations for future creativity, innovation, and entrepreneurship. These activities provide an understanding that tools exist to enable personal expression. Our kids learn to see how technology facilitates opportunities to show up in the world, to articulate identity, to participate in productive ways.



A recent report from the Organisation for Economic Co-operation and Development (OECD) on collaborative problem solving found that, contrary to popular opinion, collaborative skills—which are strong predictor of success in a connected world—are not an automatic by-product of good individual academic skills.

Andreas Schleicher, Director for the Directorate of Education and Skills, told me that, "as you would expect, the PISA [Programme for International Student Assessment] study shows that students with stronger reading or math skills also tend to be better at collaborative problem solving, simply because managing and interpreting information and complex reasoning are always required to solve problems. But individual cognitive skills explain less than two-thirds of the variation in student performance on the PISA collaborative problem-solving scale. There are countries where students do much better in collaborative problem solving than you would predict from their performance in science, reading and math."

Schleicher says that teachers can help cultivate collaborative problem solving skills by "fostering a learning climate where students develop a sense of belonging, and where they are free of fear. Students who reported more positive student-student interactions score higher in collaborative problem solving, even after considering the socio-economic profile of students and schools. Students who don't feel threatened by other students also score higher in collaborative problem solving."

Education, after all, is not just about career preparation. It's also about seeing geography, mathematics, syntax, and critical thinking as bricks with which to build whatever your heart desires. These are not simply skills and proficiencies to be leased—as labor—to employers. No, academic subjects are like the LEGO bricks humans use to connect, build, trade, and create.

Teachers, parents, and caregivers can help kids leverage playful tools to their advantage. Show them how to express who they are, where they stand, and how they imagine fitting in and contributing to a connected world.

Help them bring their imaginations to life—no matter how crazy. They can learn to take hold of essential academic content, upload it into the tools of the future, and articulate a vision of their place in the world.

## diversity & empathy: learning to negotiate difference

In addition to understanding themselves, kids also need to learn how to deal with others. To live, work, and communicate with other people, they must develop empathy and a capacity to see the world from other perspectives.

There is already a plethora of evidence which shows that digital play has the potential to help kids develop empathy. And that's not surprising when you consider the extent to which it strengthens the capacity for communication and offers exposure to diverse ideas and images. Add the right guidance/mentoring, and digital experiences can help lay a foundation for life-long tolerance and open mindedness.

We often think that tolerance can be taught by simply offering students exposure to faraway cultures. We teach them about the foods, etiquette, languages, and customs that they

would find in other places. Students can gain cultural awareness through resources like the Global Oneness Project.

But global citizens need more than just awareness. It's not enough to fill kids' heads with an encyclopedic knowledge of difference. After all, true facts about a culture's idiosyncrasies can easily morph into divisive stereotypes, hurtful slurs, or even hate speech.

Many teachers already use Skype in the classroom. In the 21st century, video chat replaces old fashioned international classroom pen-pals. And it makes some of the benefits of those expensive exchange programs affordable and almost instantaneous. Check out one of the guides designed to help you get started with virtual field trips, guest speakers, cultural exchanges, and international collaborations using Skype.

Grownups often think of Skype as a piece of productivity software, but when you're young, almost every interaction can be a playful interaction. And through play, kids develop the social skills they need to live in the world with others.

Teachers can encourage real connections through Empatico, GlobalSchoolsNet.org, PenPal Schools, or iEARN, which connect classrooms around the world to work on projects together. Check out Global Nomads for a terrific selection of ready-made lesson plans and curricula on topics like "facing difference," "gender equality," and "one world, many stories."

As our kids grow into the *macro-minded* grownups of the future, they will need to do more than just recognize difference; they will need to negotiate respectful interactions without expecting difference to transform into sameness. In a regional world, this has always been achieved through negotiating difference among local others. But in a connected world, it becomes a matter of negotiating difference among networked others.

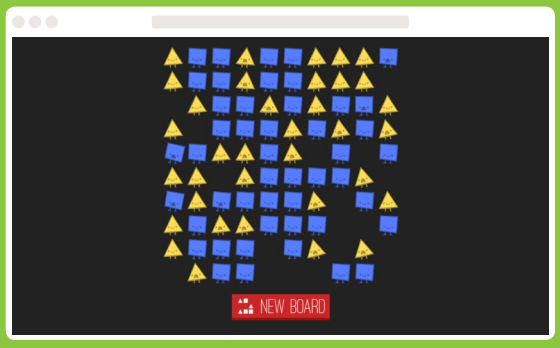
That's one of the great things about a tool like Skype: teachers, parents, and caregivers can design playful networked activities that provide students with opportunities to practice engaging with others and negotiating through interpersonal incongruities. There are also games like Way, in which two players must collaborate in order to succeed.

Researchers have known for decades that schoolyard games cultivate social emotional skills. Executive function and self-regulation skills are honed as kids work to keep playtime as fun as possible. Every disagreement, squabble, and flared temper is a learning experience—an opportunity to practice negotiating difference.[3]

Hopscotch, marbles, jump rope, and jacks were once the games that taught kids to follow rules, collaborate, and live in the world with others. But now these classic games can be supplemented with digital equivalents. After all, as we transition into a world of global connection, kids will need to practice negotiating difference in both networked playgrounds and local ones.

[3] In their fantastic book, *Becoming Brilliant: What Science Tells Us About Raising Successful Children*, Roberta Michnik Golinkoff and Kathy Hirsh-Pasek define executive function as "a fancy term for being flexible in your thinking or finding another way to solve a pesky problem without perseverating."

**The Parable of Polygons** uses concepts in game theory to illustrate ideas about diversity and bias. It demonstrates that "equality is an unstable equilibrium" and uses game mechanics to give players a sense of the way even the "smallest bias can push a whole society past the tipping point."




for the youngest kids

**Sesame Street has lots of great videos that encourage empathy. Check the YouTube channel, which features videos that celebrate diversity like "I Love My Hair," and explore this activity from Sesame in Communities together.**

**Elmo's School Friends is a web-based game in which the player helps Elmo navigate social situations (sharing, frustration, making mistakes) at school.**

**Celebrate You, Celebrate Me ($) is an interactive + singalong e-book about celebrating differences between friends. It includes Julia, Sesame Street's autistic Muppet character.**

# lenses & perspectives: how you see the world

Tolerance and empathy run deeper than just cultural awareness. Global citizens need to be able to imagine what the world looks like from other perspectives.

Of course, it is impossible to see the world through someone else's eyes. To do so, we'd need to let go of our identities completely, forget all of our own experiences, suspend a lifetime of memories, and abandon everything we've learned about situational meaning making.

Nevertheless, in order to participate in a connected world, people must be able to *imagine* what life might look like from another perspective. And digital play is a great way to practice.

Think about video games. There are always at least two "I"s in a video game. There is the *I* that holds the controller as well as the the avatar that moves around the game-world. Metacognition is built right in. From the perspective of object-relations psychology, this means that players already understand that the subjective experience of playing is, like an object, separate from the player him- or herself.[4,5] In other words, because I have chosen to immerse myself in the game, I am aware that the first-person perspective I see on the screen is a constructed experience.

Now imagine what life would look like to a young person who has been taught to understand that his or her first-person perspective of the life-world is just like a first-person perspective in the game-world. It's an object—a construction with

[4] "Metacognition is, put simply, thinking about one's thinking. More precisely, it refers to the processes used to plan, monitor, and assess one's understanding and performance. Metacognition includes a critical awareness of a) one's thinking and learning and b) oneself as a thinker and learner." Definition from Vanderbilt University's Center for Teaching.

[5] Anthony Elliott, *Psychoanalytic Theory: An Introduction* (Basingstoke: Palgrave, 2002).

which we choose to engage. Tolerance becomes possible.[7] After all, other people and unfamiliar cultures are different, not because of biology or character, but rather because they are immersed in a different view of the life-world game.

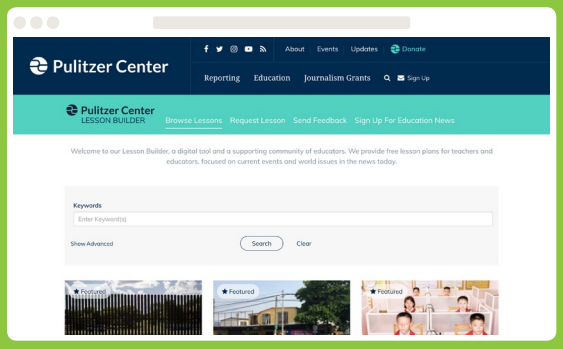
Teachers, parents, and caregivers can introduce kids to games which show the world from diverse cultural perspectives. One of my favorites is Never Alone. It's a puzzle platformer based on the traditional Alaskan native Iñupiaq tale "Kunuuksaayuka."

The Cat and the Coup is a documentary style game in which players are immersed in the life of Iran's first democratically elected prime minister, Mohammed Mossadegh. And 3rd World Farmer attempts to introduce students to the experience of farming in an impoverished part of the world.

Combine these games with comparative discussions about identity. What would it feel like to see the world from another perspective? How would your experience change?

**Although the term "object relations" predates Melanie Klein, she is the psychoanalyst most often credited for the theory. Her work looked at the way young children develop relationships with their parents. She focused on how infants learn to distinguish between self and other. At first, children see adults as objects and sort them into good and bad categories. They make judgements that can change from day to day. Sometimes a parent is "good" and at other times the same parent is "bad." Eventually, however, a healthy child should be able to merge both versions of their caregivers—and by extension, the self—into an integrated whole.[6]**

**Use the Pulitzer Center's excellent Lesson Builder to design class lessons that focus on current events and world issues. Labeled by grade level, these lessons include clear objectives, suggested activities, and study questions.**




The immersive power of video games is great, but it is not the only choice. There are other playful ways to encourage kids to look at the world through other people's lenses.

For example, many digital interactive texts and pieces of immersive journalism have been built for this purpose. NPR's Borderland looks at stories from the U.S./Mexican border. After the Storm is another example: a *Washington Post* story about surviving a tornado in Tuscaloosa, Alabama. The *New York Times* has produced many of these interactive visual stories, most of which look at areas in conflict, threatened by economic, geopolitical, or environmental factors.

It is easy to let samples of photojournalism complement existing academic content. Make it part of a social studies or earth sciences lesson. Properly contextualized, these windows into other worlds can change the way young people think about faraway places.

[6] Anthony Elliott, *Psychoanalytic Theory: An Introduction* (Basingstoke: Palgrave, 2002).
[7] Robert Kegan, *In Over Our Heads: The Mental Demands of Modern Life* (Cambridge, MA: Harvard University Press, 2003).

Global citizens should be able to imagine the world through another set of eyes. They must acknowledge other perspectives, other ways of being in the world. With guidance, mentorship, and a playful attitude, kids can learn to think about what it would be like to jump into another game avatar.

for younger kids:

**One Globe Kids ($) offers children the opportunity to meet "friends" in countries like Haiti, Indonesia, the Netherlands, Burundi, and Israel. A young host invites the user to play games, learn her language, and share her food.**

# 2

# recognizing systemic causes

It is amazing how narrow the scope of our vision can be.

Often, we barely notice things outside our immediate vicinity. We don't realize the degree to which our actions impact people on the other side of the globe—or even on the other side of town. Likewise, we barely recognize that faraway events have ramifications on our everyday lives.

You may be familiar with the butterfly effect—the idea that something as small and seemingly insignificant as the flap of a butterfly's wings can ripple outward, causing huge changes. But we rarely consider this theory as anything more than an abstraction. It mostly has to do with almost imperceptible changes that ecosystems experience over time. Does it relate to the things that shape our daily lives?

Yes, in a way, it does.

In a connected world, there are ripples of change just about everywhere you look. The trade and commerce that powers our civilizations are built on a network of global interdependence. Whether we see it or not, events in faraway places can shake up our local experience in profound ways.

Consider the pencil.

Many years ago, economist Milton Friedman used the example of a yellow pencil to illustrate the way globalized markets facilitate enormous

amounts of cooperation.[8] He pointed out that the materials that make up our most common writing utensil are sourced from all over the world. Wood, steel, graphite, brass, rubber, paint—materials are processed, refined, and shipped from distant locations before being assembled into the pencils that our children use to draw silly pictures. Making a pencil takes thousands of people, according to Friedman, "people who don't speak the same languages, who practice different religions."

did you know?

**Today, most pencils are manufactured in China. But the famous #2 pencil used for taking standardized tests is unique to the USA. The rest of the world grades graphite using letters, not numbers. The numerical system was created by the father of the famous author, Henry David Thoreau, who owned a pencil factory.**

Here's the thing: the same network that assembles parts of a pencil and ships it into classrooms also impacts just about every other aspect of the human experience. Much of the food that sustains us is sourced from other places. The medicine that heals us, the vehicles that transport us, the jobs that pay us, the knowledge that informs us—all these things depend on global trade and exchange.

Events in faraway places have enormous impact on our immediate experiences. But too often, when our children hear about natural disasters, humanitarian crises, or even political upheaval, they imagine that it only impacts the people "over there." They don't consider the degree to which we're all in this together. Nor do they think about the way decisions we make at home can transform the life of somebody very far away.

Kids should think about these things.

In the 21st century, a *macro-minded* global citizen needs to understand how causes are connected. He or she should recognize the systemic and economic particulars that impact people's lives. And he or she must acknowledge how contributing factors can be hyperlinked in non-linear ways.

How does one learn?

When parents, teachers, and caregivers use digital tools to help kids cultivate connected thinking skills, it promotes habits of mind that take systemic causes into account.

The more we encourage our kids to play and explore their world—seeing it in ways that accentuate connection and interdependence—the more automatic their global awareness becomes. Along the way, they'll learn to associate digital tools with cooperation and kindness. That's better than just promoting individual achievement and fierce separatism.

Sure, global citizens know how to use the tools that shape our world. But it's what they choose to do with them that matters most.

[8] Milton Friedman was a Nobel Prize-winning economist best known for advocating for free market economic policy. He borrowed the pencil story from a 1958 essay by Leonard E. Read entitled, "I, Pencil."

# wealth & poverty: causes, connections, and commerce

The world is full of economic injustice.

When teaching kids about inequality, it's tempting to make it all about the shocking statistics. Do the kids in your life understand that half of humanity lives in poverty? Three billion people survive on less than $2.50 per day. And almost half of them—1.3 billion—live on less than $1.25 per day. In sub-Saharan Africa, 589 million people live without electricity and 273 million lack access to clean water. Moreover, the Internet is full of pictures of starving children, slums, and shantytowns. In a connected world, the poor are not hidden in shadows. Their images are all around us. Using resources like Gapminder, you can help kids become aware of disheartening global realities.

But all awareness is not good awareness. For too long, awareness has been coupled with the idea that poverty is caused by the victims themselves. We're encouraged to see wealth as an indication of moral superiority and intellectual sophistication. Therefore, images of less-fortunate people can sometimes send subtle messages that those who are impoverished are not as good at living in the world.

Of course, that's not true.

Researchers have connected the dots between geography and political economy: historically, some people found themselves in the right place at the right time, surrounded by the perfect mix of natural resources—timber, fresh water, fewer predators, more fertile soil. Others weren't so lucky.

How can you help kids see the realities of economic growth? Try using real-time strategy games. FreeCiv, an empire-building strategy game similar to the big-budget Civilization ($) is explicitly tied to history. But with the right guidance, any game that combines resource management with tower defense and expansion, can be used to demonstrate how empires come into power. Kids will see that the rich and the poor live in a symbiotic relationship. Socio-economic status is always part of system.

Macro-minded global citizens need to understand the systemic causes of poverty. They should recognize how geopolitical and environmental factors impact trade and commerce. And while it's good for them to have some awareness of the places in the world where poverty is worst, it would be impossible for every individual to have a complete understanding of all the factors that interact to create injustice everywhere.

Therefore, what's most important in a connected world is that today's kids have an understanding of the way systems function, that they approach world issues with an assumption that there are a variety of institutional, geopolitical, and economic causes at work. For this, they need to be proficient at complex systems thinking.

Digital play is one of the best ways to encourage systems thinking. Especially when kids make their own video games, they learn to think about the way the relationship between elements and components can influence outcomes. Parents, teachers, and caregivers can encourage kids to make their own games using platforms like Gamestar Mechanic, Flowlab.io, and Bloxels.

These apps won't tell kids much about the enormous wealth gaps that plague the world, but they will prepare young people to think in connected ways. They'll have a foundation in systems thinking, a starting point from which you can engage them in smart conversations about the institutional factors and environmental causes which interact to create the global economic reality.

Soon, you'll be able to ask them to consider how component parts work together for better and for worse. Then, you can reframe the poverty discussion. Hopefully, it will become less about expressing sympathy for infantilized others, and more about engaging in activism at home.

**Systems thinking** is playful and inter-subjective. It defines order according to the way things interact with one another. It privileges the quality of the relationship between nodes rather than trying to figure out what is first, last, and in-between (value judgments). Systems thinking encourages us to understand content in context—and to see the interconnectedness between elements. It's all about networks and the ways in which nodes relate to one another. It's one of the epistemological building blocks of global citizenship and social community. For more about systems thinking, please see the Institute of Play's Design Pack: Systems Thinking.

## supply & demand: understanding economics

One of the hardest things about teaching economics is helping students recognize that the markets in which they participate are not just facts of life. Context is constructed, not absolute.

Often, when people think about commerce and trade, they might think about buying and selling, retail and wholesale. Kids see the adults around them purchasing groceries, giving gifts, buying toys, paying bills. Along the way, they will learn to construct their sense of self in a way that aligns with the predominant economic paradigm.

In a capitalist society, that means they want to see themselves as hard workers, their worth defined by earned income, their identity articulated through the clothing they wear and the products they own. Values, ethics, and beliefs about good and evil are tied to the means of production.

But what kids don't realize is that they are always taking part in a constructed economic reality. Like the story of the fish who doesn't know that he's swimming in water, people struggle to see their own context—the system in which they earn and spend.

In other words, they lack a macro-minded perspective.

In a connected world, everyone should understand a bit about how economies work. And there are thousands of games and simulations that are designed to teach basic concepts. There are even some well-produced online videos. But to nurture younger kids into

global citizens, the most important thing is to point out that every game has rules. Ask students to consider how boring a game would be without them.

Imagine playing ball with no court, no goals, and no way to score. You just grab the ball, or kick it, or hit it with a stick—do whatever you want. It doesn't matter. Then, you can run wherever you fancy—in and out of buildings, all over the neighborhood—there is no limit, no purpose, no objective. How does that sound? Pointless? It is the limitations, boundaries, and rules that make a game fun. They make it work. They make it fair.

When kids think about economics, they need to recognize how markets are constructed to make it possible for trade and exchange to happen in an organized way. Commerce is like a game, and all games depend on certain rules and regulations. We agree on the value of currency and we agree that you can't just steal. If we didn't have basic rules about worth and ownership, the whole market would just collapse.

Already, with this simple metaphor, we've introduced many of the big ideas in economics. Now students are thinking about markets with objective distance—they're seeing it as a game that could be constructed in various different ways.

Next, teach them about types of capital. Chances are they've already played basic resource management games. And a game like Minecraft is a great way to take that lesson further. Use a guide like this one to craft lessons that help them understand the relationship between resources and capital.

Once they have a good sense of how that works, you show them how the markets themselves are often at the whims of external forces—environmental and geopolitical. With the guidance of a good teacher, a real-time strategy simulation game can help kids understand political economies. Too often, we imagine that the game has to be about money or resources to teach economics. In that regard, games like Oiligarchy and Offworld Trading Company ($) are great. But even a basic tycoon-style resource management game like Parkitect ($) can do the trick.

## buying & selling: conscious consumerism

When young people have a basic understanding of economics, they can recognize the way their individual choices impact the world. They can set macro-minded intentions. They can see the thread that ties their purchasing decisions into a knot on the other side of the globe.

Ask kids to think about all the shopping experiences they've had. They rarely buy their own stuff. But they probably spend a lot of time accompanying their parents or caregivers on trips to big box retailers like Walmart, Tesco, Target, and Carrefour. Imagine standing in one of these superstores, the fluorescent lights glaring down from above, pleasant pop music playing over the loudspeakers. How many different items are available? Where are they made?

For better or worse, big box retailers constitute the retail marketplace of a globalized world. They operate in parallel with online counterparts like Amazon and Alibaba. Sure, there was a time when family merchants carried their goods to the city. Mules pulled wooden wagons

to market. Boats sailed into a floating talātnām. Camels hauled spices to the local souq.

Now, sophisticated logistics carry pallets of cheaply manufactured goods to a big box bazaar.

Games like Logistics Expert can help kids imagine what it's like to ship and receive cargo in a globalized world. BrainPop ($) has animated videos about manufacturing plastic, assembly lines, waste management, and more.

Mini Metro is essentially a smartphone game about moving human resources. Its gameplay can launch a conversation about how transportation impacts trade. Then, as kids imagine thousands of workers riding by metro, commuting to and from work, they're ready to think about labor. They can understand that people are products in a global economy; the energy their parents expend is traded, as contribution to their nation's GDP.

Thinking of people as resources can be difficult. But digital play can make it easier to talk about human capital. Remind kids of that when they play games like Village of Souls ($), where players purchase villagers to increase their strength. Macro-minded thinking requires citizens to understand the economics of labor.

Of course, not all labor is the same. Around the globe, people are exploited, some more than others. The United Nations estimates that 168 million children (ages 5–14) are forced to work. In Bangladesh, the average hourly wage for a garment worker is $0.13. It's only $0.26 in Vietnam. These workers make many of the products a child would encounter at any big box superstore. It's a tough reality to accept, but a game like SIM Sweatshop can make a complex issue more approachable. It puts players in the role of a factory worker who has to meet a specific daily quota in order to be paid.

The moral quandary only gets more complicated when it comes to trading energy. A game like Oil God makes that clear. Players try to double consumer gasoline prices in five years using any means necessary. They wreak havoc on governments and economies in the process, giving little thought to the people whose lives are impacted. Consider exploring Phone Story with older students. Released in 2011, the game provokes players to think about the exploitative supply chain that puts the iPhones that we love into our pockets. It was pulled from the App Store soon after it was released, but is still available in the Android store.

What will your students do? How will they calibrate their moral compasses?

# spending & debt: financial literacy

There are so many ways that kids can learn about financial planning through digital play.

With some of the Motion Math ($) games like Pizza or Cupcake, they'll get an introduction to the calculations involved in budgeting. They'll think about the cost of goods, expenses, and sales. BrainPop ($) has games and videos about mortgages, credit cards, and taxes. Credit Stacker will help them understand different types of debt. Older kids can use an online simulation like The Stock Market Game to think about investing, asset allocation, diversification, and inflation.

These games are great at providing a systems view of finance. They learn the fundamental skills needed to manage money in a connected world. The only problem is that most financial literacy apps provide a very Americanized perspective on capital and wealth accumulation: through personal determination and persistence, individuals get ahead in the world—growth and prosperity are indicators of providence.

There's nothing necessarily *wrong* with this point of view, provided you live in a capitalist economy, where financial products are king. But remember that these are the skills associated with a specific conception of individualism and affluence, not global citizenship. Macro-minded folks need additional skills as well.

The challenges of financial planning can look very different for people who live in different circumstances. Introduce kids to a game like Ayiti: The Cost of Life, which asks them to manage the finances of a poor Haitian family over the course of four years. They'll discover that the fundamentals of money can change in radical ways depending on your context. It's easy for people to recognize that experiences can be very different for people in faraway places. But do your students know that even in the world's richest economies, the working poor can live right alongside the wealthy?

**for the youngest kids**

**Sesame Workshop offers a toolkit for parents and educators featuring Elmo to help children develop an understanding of what money is and how they can make good choices.**

**Elmo Loves 123s is an app that teaches early math skills like counting, one-to-one-correspondence, adding, and subtracting.**


Spent is a simulation game about the working poor. It aims to demonstrate that hard work, grit, and perseverance can't always help you get ahead in the world. Sometimes the deck is already stacked against you.

Parents, teachers, and caregivers need to teach kids about more than just how to earn, save, and spend. Global citizens need to understand finance from a broad perspective.

**The "working poor" are people who spend 27 weeks per year or more in the labor force, but whose income level remains below the poverty level. According to 2013 census data, one out of every three families in the United States is classified as working poor. In the European Union, it's 9.6 percent of the working-age population.**

# policy & governance: regulation, influence, and activism

Once kids understand the economic factors that influence their everyday experience, they can see how governance functions to keep elements of a complex system in check. A game like The Fiscal Ship can help them recognize that domestic factors need to be managed and that foreign policy is often tied to global trade.

A systems view of world economics is a crucial part of preparing kids to be global citizens. But their macro-minded perspective is not adequate in itself. Awareness just makes you a cosmopolitan elite—sympathetic and well-informed. In a connected world, citizens must also be equipped to consider, understand, and execute individual actions and choices that affect a global community.

Digital play can help kids understand how to take action, how to get involved. It can help them see that they have autonomy, that their voice matters. Deeds, no matter how small, can sway the course of human events. Local actions can have global consequences.

That means true global citizens also need to understand how things work close to home. In a connected world, it's easy to forget how much national and regional politics matter. But good global citizens are good local citizens first.

In the United States, there are tons of digital resources that aim to help people understand how their democracy functions. For example, BrainPop ($) has an impressive collection of animated videos about the U.S. government. Also, check out iCivics; it was developed by Justice Sandra Day O'Connor to give "students the necessary tools to learn about and participate in civic life." Its growing collection of games includes Executive Command, which demonstrates the scope of presidential power; Activate, which shows players how to get involved in positive change; Court Quest, which simulates the process of navigating through the justice system; Immigration Nation, which illustrates the path to citizenship; and Crisis of Nations, which puts players in charge of diplomacy and foreign policy. And there are many more.

But even when kids have a complex understanding of how government institutions work, they can't become forces for positive change unless they have access to good data that can be evaluated to make informed decisions. Freedom of information is crucial. And critical media literacy goes right alongside it.

In a connected world, kids have unprecedented access to information. The World Wide Web puts just about any image or idea a swipe or a click away. But how do grownups teach kids to distinguish propaganda from honest reporting? Fake news from reputable journalism?

Try a game like Fake It to Make It, which raises ethical questions about journalism, showing players how easily profit can trump truth. Factitious is a fun interactive quiz game which uses real media examples to illustrate how hard it can be to separate fact from fiction. Even when you have the names of the sources their validity is not always clear—sometimes not even to publishers themselves. The Republia Times demonstrates that it can be extremely difficult for a news source to remain objective while operating within a complex economic and political system.

There are many digital sources which can inspire kids to think about how everyday life has global ramifications. They can easily be encouraged to think critically about the media and entertainment they consume. Then, with clear information and an understanding of how local and regional institutions function, kids are prepared to take on the responsibilities of global citizenship.

### news literacy

**Kids are increasingly exposed to fake news, political satire, and real news stories that are just frightening. They need grownups to help them learn how to separate fact from fiction and to develop critical thinking skills.**

**The National Association of Media Literacy (NAMLE) offers material for parents and educators, and it organizes conferences and campaigns to raise media literacy education as "an essential life skill for the 21st century."**

**Common Sense Media shares tips and resources for parents to help their children become savvy news consumers. Videos, articles, and FAQs are available for parents of preschool children all the way to teenagers, but grownups might also learn quite a bit along the way.**

# 3

# world, planet, climate

Macro-minded individuals have a strong sense of self. They acknowledge others. They appreciate diversity. They understand economics. They recognize systemic causes. They think in big-picture-ways about the connections which shape our world.

Additionally, they know that being a global citizen is not only about how you relate to people in other parts of the world but about how you relate to the planet.

How does the digital world connect with nature?

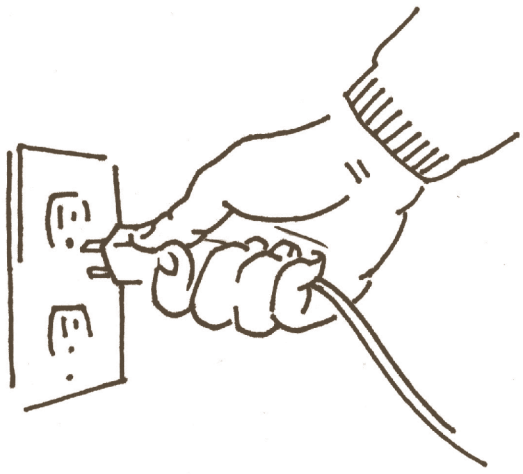
About 3.811 billion people, or 51 percent of the world's population, are connected to the Internet. More than half of its users gain access through a mobile device. But because we use ethereal metaphors like "the cloud" to describe the place where our data is held—since so many of our connections are wireless and the GPS-enabled mapping app on our phones beams directions down from satellites in the sky—we rarely think about the tangible earthly materials which make digital connections possible.

In the information age, we don't feel grounded. But we are still literally tethered to the planet. We see Wi-Fi iconography everywhere we look. Headphones can connect without cords, by Bluetooth. Phones can charge inductively, without being plugged in. But don't be fooled; our world is still wired.

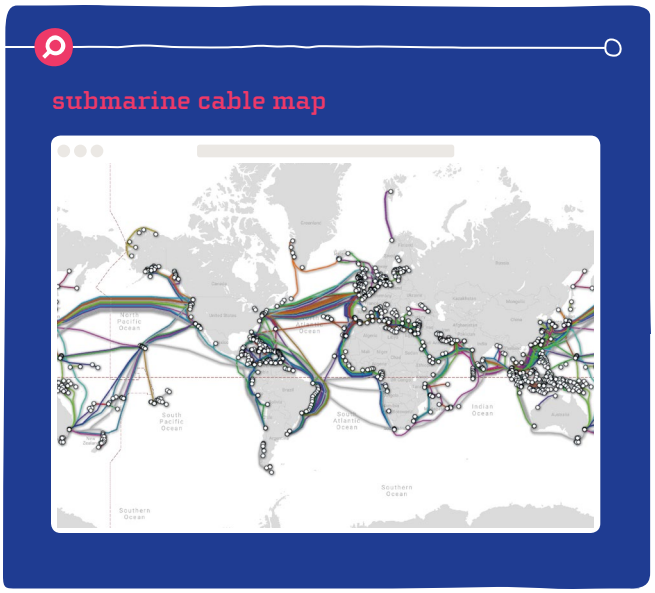
In fact, 99 percent of international data is transmitted by submarine cables. Today's technology still looks a lot like the old tin-can and twine make-believe phones.

Your kids would be fascinated to see a map of the wires that line the ocean floor (shown to the right). Perhaps they'd imagine little fish swimming around the cables. There are probably barnacles attached and crustaceans who scuttle alongside. The fiber-optic thread that connects us, by sending electronic packets of information along the seabed, spans 550,000 miles.

The first undersea cable was installed around 1858. It was used to send telegraph messages between Ireland and Newfoundland. It took 17 hours and 40 minutes to send the first marine communication—just a few sentences long, shorter than this paragraph. It sounds unbearably slow to those of us who have grown accustomed to high-speed DSL or cable broadband, but remember, it was a time when written letters were still delivered by steam engine. So, by comparison, telegraph messages must have felt fast.



Today, we don't greet ships at port. Amtrak stopped delivering mail by rail in 2004. We don't see how information travels. Digital distribution is largely invisible. In fact, most of the infrastructure that supports our lives is hidden like the wires beneath the sea. But global citizens need to acknowledge its existence. We depend on energy grids, nuclear reactors, water treatment plants, and more.




To be macro-minded is to see that humanity builds its civilizations upon the earth's resources. The planet's bounty feeds us. Its minerals power our lives. Its land holds us. Its water quenches our thirst. We are part of an ecosystem—even if the ties that bind us remain out of view.

We desperately need to teach our kids to see the ways in which they interact as part of a complex system—a system which depends on natural resources.

Digital play can help . . . if we let it.

Unfortunately, people tend to think of digital play and nature as opposites. They imagine that kids are either inside staring at screens or outside playing with worms and dirt. But this polarity does more harm than good. It doesn't urge the gamers out onto hiking paths. Instead, it encourages the kind of environmental disregard that threatens our planet.

We need to nurture macro-minded young people who know that human innovation is always partially environmental. Everything we have comes from the earth.

Through technology, we interact with the planet. Our tools exist in relationship to the natural contexts in which they were developed. They can have both positive and negative effects on the world in which they operate.

Parents, teachers, and caregivers need to abandon the tech/nature dichotomy. Frame things differently. Show kids how digital technologies can be leveraged to measure, observe, and interpret the planet.

"Climate Action" is number 13 of the 17 United Nation's Sustainable Development Goals. At least seven others explicitly relate to natural resources. And one could argue that all the others are, in some way, related to the sustainable well-being of the planet.

Connected thinking for a globalized world requires kids to understand that human civilization is linked to the natural world.

## earth: it's not all disaster

Why do so many of our lessons about respecting the planet begin with apocalyptic fears?

Most environmental scientists agree that global warming, if left unchecked, will continue at a pace that will make the earth eventually unable to sustain human life. There are games like Climate Defense that make this reality clear. But teaching children to imagine Earth as something fragile, frail, and on the verge of collapse is not necessarily encouraging the kind of respect that our planet deserves. Let's also cultivate an appreciation of beauty. Create a sense of wonder and awe.

Use a game like Walden ($) to embrace Thoreau's Romanticism and rediscover the serenity of nature. It will help kids become acquainted with the planet they inhabit by bringing the poetry back to STEM (science, technology, engineering, math) learning. We often think of engineering, innovation, and technology as if it were an affront to the planet. That's the premise of Bioharmonius, a game about the balance between nature and machinery. But the dichotomy wasn't always taken for granted.

For most of human history, science was called natural philosophy; it was all about discovery. And our most innovative thinkers developed instruments to get a closer look at the earth's wonders. Consider Galileo's spyglass, the geometric protractor, computational punch cards, the electron microscope. These tools are the ancestors of modern technology and they were all designed to provide a closer look at nature's beauty, to show us what was beyond the scope of the human eye.

Global citizens need to understand that innovation exists where science and nature intersect. They need to see technology as a way to interact with the planet, not as something separate. In the long run, this will prepare them to consider the ethical ramifications at the core of every relationship between the tools we use and the planet that sustains us.

Many of the playful projects from Microsoft's Hacking STEM website can encourage this attitude. Easy and inexpensive (under $5.00 per student) makerspace projects combine robotics, Excel databases, and found objects to teach kids how digital tech can help them appreciate the natural world. If the classroom has one Arduino microcontroller and a PC, kids can use a plastic cup and some wire to build a working seismograph. Use some coffee cups and a straw to build an anemometer to measure

wind speed. There's a growing collection of activities that will make kids see digital tools as a way to bring new insight to outdoor play.

Reach for the Sun ($) by Filament Games demonstrates how plants use photosynthesis and pollination to grow. Disaster Detector, from the Smithsonian Education Center, or Stop Disasters, from the United Nations, will ask students to think about the planet's power as they analyze data and strategically plan for the worst that nature can throw at us—tsunamis, hurricanes, volcanoes, and more.

To give students a sense of just how far we've come, in terms of our technological capacity to view our world, show them Earth-Now. It's a NASA app (for both iOS and Android) that provides users with real-time data about the state of the planet. They can see on-demand metrics about air temperature, carbon dioxide, carbon monoxide, gravity field, ozone, sea level, soil moisture, and salinity.

**for younger children**

**NASA's Space Place website features games, activities, and resources about Earth including videos and downloadable posters and crafts.**


## how to run the world: energy & infrastructure

Today, when many of us think of "connections," we think about how we connect to others virtually. We imagine logging into websites and social media platforms.

But long before telecommunication, humans were building physical webs and grids. Shipping has moved along waterways for millennia; rivers are nature's networks.

In the industrial age, humans laid the tracks along which locomotives travel. They paved roads and constructed complex highway systems. In the ancient world, irrigation canals connected farms to distant water sources. Aqueducts carried drinking water from the mountains to faraway cities. Sewers are just connected waste management systems. And a web of electric wires powers most of the modern world.

In connected times, kids should have a clear understanding of how infrastructure enables civilization. And digital play can help.

Perhaps students can start with Ludwig, a PC-based game that teaches how power is made from fire, water, wind, and sun. Show kids how energy is extracted from nature. Then, use a game like ElectroCity to introduce concepts like renewable energy and environmental conservation. Players take on the role of mayor and suddenly, energy is not just an issue of having enough power. There are political, ethical, and environmental quandaries everywhere.

Pipe Trouble ($) is a puzzler that asks players to construct a natural gas pipeline while considering budget, deadlines, environmental impact, and community responses. Just like in the real world, the gas line provides a service to the city, but still, the residents sometimes object. How does a municipality maintain growing infrastructure while also balancing competing agendas?

Often hidden behind the bright lights and powerful technology of our urban homesteads, is the reality of sanitation challenges. Where does our waste go?

In Cairo, the largest city of the MENA (Middle East, Northern Africa) region, there's no trash service. A small community called the Zabaleen—literally "garbage people"—collects and recycles the trash. They carry it to their village and process it there. PBS produced a documentary about it in 2009 called *Garbage Dreams,* and there's a simulation game that goes along with it. These resources can help make concrete the otherwise abstract issue of waste disposal.

The Zero Waste Game and Recycle Roundup will encourage kids to think about reducing and reusing waste. And with SimCityEdu: Pollution Challenge! ($) they'll see that garbage is not the only kind of biproduct that needs to be managed.

Once they understand these issues, kids can try City Rain ($), a strategy game that asks them to restructure cities before they are penalized by the World Environmental Protection Agency (WEPA).

## water: thirst, hygiene, and sanitation

Many of the earliest video games featured water levels even before developers had the ability to render realistic looking graphics. Sometimes everything turned blue and the in-game physics got a little sluggish: think of the famous underwater levels in the original *Super Mario Brothers*. Other times, water meant that a section of the game space was out of bounds: think of *Frogger*. In addition, many strategy games take place on maps with blue areas that signify water.

There have been games that include boats, water sports, plumbing, and even a crocodile taking a shower, as in Disney's game Where's My Water?

What all of these games have in common is that they take water for granted.

Seventy percent of the planet is covered in water. H20 is ubiquitous. But water shows up very differently in different places. Use digital resources from NASA like Climate Kids to start a discussion about how important water is to the ecosystem. Then, use the interactive maps from the Water Resources Institute to see the water risks in various parts of the world.

How many kids realize that 663 million people do not have access to clean water? That's 1 in 10 humans. Furthermore, 2.4 billion people (1 in 3) do not have an adequate toilet. How do they wash? Where do they go to the bathroom? What do they drink?

Global citizens need to be aware of the whole story around water. Show them videos from National Geographic to get them thinking about how dependent we are on $H_2O$. BrainPop ($) offers fun videos about the water supply and water pollution. And this 360-degree VR video tells the story of a 13-year-old girl named Selam, for whom fetching water is part of her everyday experience. She is often forced to choose between water and school.

**In places where people have access to clean water, the cost of a shower can vary greatly. It costs $.16 in the United States, $.03 in Argentina, and $3.38 in Papua New Guinea.[9]**

A game like WaterQuest can help young people consider water challenges in the rural highlands of Madagascar. Kids who have never struggled with water scarcity probably haven't even considered just how important water is to their lives. Germ Zapper will remind them about basic hygiene. And Angry Turds can inspire a conversation about the necessity of clean, private, safe places to use the bathroom.

Show kids that water is a health issue, a gender issue, an economic issue, and an agricultural issue. Help them think about water from a macro-minded perspective.

## displacement: migration and refugees in a connected world

In 2015, the *New York Times* argued that like food and shelter, smartphones are now indispensable survival tools for refugees "In this modern migration, smartphone maps, global positioning apps, social media and WhatsApp have become essential tools," wrote journalist Matthew Brunwasser.

It is hard to overstate the impact smartphones have had on global migration. To kids whose lives are mostly stable, the devices that they have access to, whether their parents' or their own, already feel vital. Ask them to imagine how much more crucial the gadgets must seem to folks who have been forced to flee their homes.

With a smartphone, displaced people can connect with loved ones, navigate toward uncertain destinations, and search for answers in unfamiliar places. In the United States, we often hear stories of early 20th century immigrants arriving in cities they'd only seen on postcards. Folks once carried pocket-sized dictionaries and struggled to learn new languages on the fly. Many never connected with the people back home again. But that experience has been completely transformed by portable connected devices which can translate, communicate, and orient people in scary new situations.

In addition, digital media has brought the refugee experience out of the shadows.

[9] Saad Ahmad, "The Cost of Showers Around the World #Infographic." The Cost of Showers Around the World #Infographic ~.

Grownups and kids can see how complicated a journey can be. Tomas van Houtryve has collected what he calls "digital breadcrumbs" from the social media posts of refugees traveling along Europe's migrant trail. The crisis in Syria has inspired a plethora of stories and films—some of which can be viewed with a browser or an inexpensive VR headset like Google Cardboard. (Since some of these can be disturbing, grownups should view them first to decide whether or not their kids are ready for the experience.)

Two Billion Miles from Channel 4 is an impressive piece of interactive storytelling; it combines photos and sounds into an experience that functions almost like an old Choose Your Own Adventure novel. Amnesty International's Fear of the Sky is a similar immersive experience that focuses on a city constantly threatened by illegal barrel bombs. The Displaced, from the *New York Times*, leverages the power of VR to tell the story of three children who are forced to flee their homes. In Clouds Over Sidra, a 12-year-old girl takes viewers on a 360-degree VR tour of the Zaatari Refugee camp in Jordan, home to 130,000 Syrian refugees. *The Guardian* has also created a VR experience called Limbo, about waiting for asylum.

There are also games which aim to elucidate the migrant experience. Against All Odds was created by the United Nations Refugee Agency. The Migrant Trail offers a first-person simulation of the journey across Arizona's desert, from central American into the United States. Players can take on the role of undocumented migrant or border patrol agent.

In addition to empathizing with the experience, global citizens should all recognize the environmental, economic, and geopolitical causes of migration. Of course, humans have been migrating for thousands of years, but there are currently 60 million people fleeing violence or persecution. This TED-Ed video—What Does it Mean to be a Refugee?—explains it in terms kids can easily grasp. Help them understand how some factors "push" people from their homelands and others "pull" them toward new places. There are tons of short videos online that can help.

**Check out this guide on migration and refugees from the Pulitzer Center. It features many fantastic lessons about migration for kids of all ages. One discusses the struggles on the Greek island of Lesbos as it receives a steady influx of refugees from Turkey. Another looks at some of the reasons why families from Mexico, Honduras, and Guatemala migrate north into the United States. And there are many more.**

It is also important that macro-minded individuals understand that the stories on the news can often be politically motivated. For example, only a portion of migration takes place in the Middle East or around the U.S./Mexican border. These areas get lots of attention, but there's more to the story. Show kids an animated map, like this one from MetroCosm, so they see how the flow of people really moves around the world. And this video from *The Economist* reminds us that despite the fear mongering around unwelcome foreigners, the bulk of migration happens to and from nearby regions.

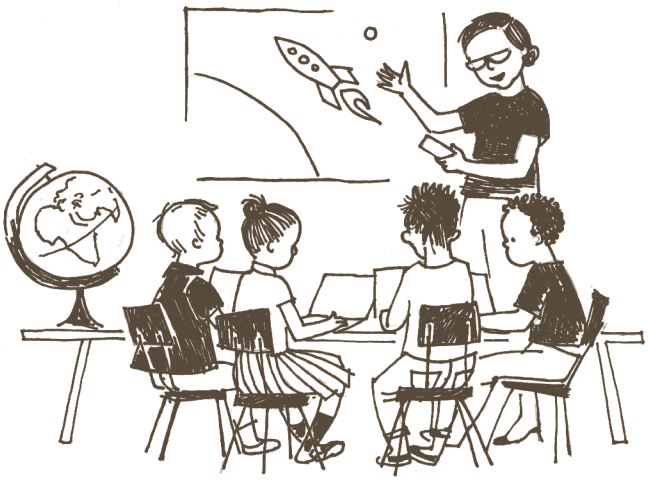
# conclusion

*Dear Readers,*
Back in 2013–14, I wrote the *Mindshift Guide to Digital Games and Learning* in partnership with the Joan Ganz Cooney Center. With a collection of blogs and a downloadable PDF report, we tried to persuade teachers and parents to incorporate more high quality video games into the school experience. At the time, classroom technology was changing quickly, and I wanted to make sure that educators leveraged the new tools to bridge real social, emotional, cultural, and cognitive gaps.

But I have a confession to make: before I started writing about video games, I barely ever played them. Yes, I had an Atari 2600 when I was a tween and I spent hours struggling to beat Q-Bert while holding a black rubberized joystick that never seemed to behave in the way I expected. But by the time I was in college, I had abandoned digital play altogether, even condemning the games as superficial distractions. Digital interactive media seemed to be like a soap opera: bad entertainment for folks who were easily sidetracked. Not me! I was focused and determined; I wanted to figure out how to use my skills in ways that would make the world a kinder, more compassionate, more equitable place.

Years later, when my sons started playing on tablets, consoles, and laptops, I joined in every now and then. We all played *Minecraft* or *New Super Mario Bros* together. And that's when I realized that video games were amazing teachers. At the time, I was working as the lead administrator of the small progressive school my boys attended and I realized that many of the things which made our best teachers so successful were the same qualities that made video games fun. In fact, if you survey the research on effective teaching, it sometimes sounds like it could just as easily be describing video games.

For instance, engaging video games and great teachers both take advantage of the zone of proximal development. Everything sits in that sweet spot where the objectives are difficult enough to keep participants interested, but not so challenging as to cause frustration. Great games and teachers both use constant formative assessment and provide immediate feedback, enabling students and players to iterate their strategies without a fear of failure. Both games and teachers provide constant opportunities for metacognitive reflection, ensuring that participants are learning how to learn, and therefore cultivating skills that have broader applicability. And both teach their participants through immersive, hands-on experiences. It's learning by doing.



Imagine what would happen if games were about regular academic subjects rather than fantasy worlds; our kids might learn to navigate molecular chemistry and quantum mechanics as quickly as they learn to navigate *Assassin's Creed* and *Bioshock*. It's no wonder that many policymakers, philanthropists, and venture capitalists love this idea. They figure that through digital play, it will be easy to deliver great learning and teaching at scale; building a game is a lot less expensive than training millions of teachers. And therefore, the fantastic pedagogy that used to be available only to the elite might soon be accessible to many more people.

But while that's a great bonus, it's not really my goal. I wrote this guide because it's clear to me that we are now living in a connected world and therefore, we need to prepare our kids in connected ways. Today's students all need to learn how to work collaboratively, to care about collective success, to value teamwork. They need to value equality, inclusivity, identity, tolerance, and global citizenship. Their education needs to enable creativity, exploration, and playful learning across socio-economic lines, across traditional subject divisions, across geo-political borders, and in intergenerational multiplayer modes.

Digital play is an appropriate way to teach these lessons. Why? Because while today's children are playing online, they are also learning to be comfortable with a specific technological worldview. They're developing the confidence to operate and experiment with digital tools. They are applying higher order thinking skills within virtual environments. They are also becoming acclimated to subtle social cues and nuanced behaviors. They're procuring habits-of-mind for a connected world.

Child development and education are both always about how young people learn to make use of language, knowledge, and academic content within the context of lived experience. Although we often think of "context" as if it were some sort of abstract cultural or historical zeitgeist, the reality is much simpler. For humans, context is all about how we use specific sets of tools to intellectually, emotionally, economically, and materially fabricate our world.

Digital tools are the new context. There's no better way to prepare kids than through digital play.

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