Deconstructing Science and Democracy: Making Meaning in a Convoluted Era

by Alex Morgan, MA

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This article is written in collaboration with the children of Room 10 (two to three years old), Resident Teachers Sammi Kurk and Kate Patricoski, and Mentor Teacher Lauren Berry. Framework for STEM at Boulder Journey School developed in collaboration with Mentor Teachers Ricky Alan, Cher Clevenger, Kayla Klinzing, and Jana Manaker.

As we reviewed documentation of toddlers Ace, Dovlyn, and Ellery encountering a clay structure, we noted the variety of actions in which they engaged: pulling, breaking, tearing, rolling, pinching . . .

It occurred to us that the central action the children engaged in was *deconstruction*. The definition of deconstruction is "the act of breaking something down into its separate parts in order to understand its meaning" (Cambridge English Dictionary, n.d.).

This is very different than the definition of *destroy*: "to damage something, esp. in a violent way, so that it can no longer be used or no longer exists" (Cambridge English Dictionary, n.d.).

Link

Video of children encountering clay: deconstruction
youtu.be/HRMvYGovecQ

Deconstruction of clay

Deconstruction is how children often approach their world. They topple block towers, rip paper, smoosh clay, and stomp sand piles. These actions are not to destroy, they are to make meaning. This is not something that only children do, the action of deconstruction spans all ages.

Context of Boulder Journey School

At Boulder Journey School, a school for early childhood education and teacher education in Boulder, Colorado, we invite teachers to form research partnerships to uncover strategies and deeper understandings around our contextual curriculum. Carlina Rinaldi (2006), president, Reggio Children – Loris Malaguzzi Centre Foundation, discusses the term "contextual curriculum" to explain the concept of *progettazione*, a practice of honoring learning as a collective and flexible activity that unfolds through participation in experiences and the subsequent reflection (p. 206). The schools in Reggio Emilia honor and encourage the active participation of every member of the community, embracing the "philosophy of education as relationship" (Edwards, 1995, p. 1). Taking inspiration from this philosophy, Boulder Journey School has explored the meaning of contextual curriculum within our own community. Executive Director Alison Maher and School Director Andrea Sisbarro (2018, June 21) offer that contextual curriculum

> places strong emphasis on the idea that learning happens in a context. Learning happens in relation to and as a result of experiences, environment, relationships, family, community, culture, and politics. If we believe that learning happens in a context, then no singular, predetermined, standardized path for learning could serve as an appropriate curriculum. A contextual curriculum challenges the belief that learning can be reduced to a specific list of objectives and outcomes.

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assessment. In daily practice with children, we cycle through this process. We ask questions then facilitate experiences that might help us to uncover hypotheses about our questions. We observe and document this search for answers, then use those observations and documented artifacts to analyze and reflect on the experience, which in turn offers us the space to reframe our questions and plan our next research steps (Gandini & Goldhaber, 2001). It is the continuous engagement in these cycles that form our contextual curriculum, always developed in collaboration with the protagonists in the children's lives, including teachers, families, administrative faculty, community members, the physical environment, the current social and political climate and, of course, the children themselves.

Embracing a curriculum that has no fixed end point supports the commitment we have made to engage in anti-bias and anti-racist education. We feel a strong responsibility to support the development of thinking that is antidotal to characteristics of a white supremacist culture, including a belief that there is "one right way" to approach ideas (Okun, 2021). We look to educators of color to learn strategies for weaving anti-racist thinking into every aspect of our school life and view classroom experiences across content areas as opportunities for critical pedagogy, a stance that rejects the notion of neutrality in education (Freire, 2014) and embraces engaging and activating critical consciousness within school protagonists (Miller, 2021).

The input from these many protagonists invites us to view the curriculum through many lenses, including social emotional engagement, social justice and equity, STEM, and more. It is with these pedagogical foundations that, in the 2018–2019 school year, one group of teachers self-selected into a research group to study STEM and its role in engaging young children in critical examination of the world we all inhabit.

STEM in Early Childhood

Investigating the role of STEM in early childhood can be a daunting task. The acronym STEM represents the disciplines science, technology, engineering, and mathematics. These words do not reflect the warm and fuzzy language so many of us in early childhood education gravitate towards. Stuck before we even began, we subconsciously reached back for the strategies we used as toddlers. *We deconstructed*.

First, we deconstructed the word STEM. The origin of the word STEM arose from the recognition that the United States was falling behind in the increasingly important STEM fields in the global economy. Essentially, the acronym was popularized to speak to the need for educating students for the changing workforce (Department of Education, 2010).

The origin of STEM seems to focus on a distant end point, specifically producing workers of the future. But what does this mean for young children now? After all, we are students of John Dewey (1893), who begs that we "cease conceiving of education as mere preparation for later life and make it the full meaning of the present life" (p. 660).

It felt important that we gain an understanding of the currently existing definitions of science. In our search, we encountered this definition:

> Science (n): "the state of knowing: knowledge as distinguished from ignorance or misunderstanding" (Merriam-Webster, n.d.)

And that is how we felt confident in recognizing that participation in science is an innate act of early childhood; children are researching their world to come to a state of knowing. In fact, that is the primary research of children. When examining children's work through this lens, we can see that children are always engaging in scientific research. In her presentation "The Teacher as Researcher," Carlina Rinaldi (2003) proposed,

> The concept of "the normality of research," which defines research as an attitude and an approach in everyday living, in schools and in life . . . as a way of thinking for ourselves and thinking with others, a way of relating with others, with the world around us and with life. Where and how can we find the strength and the courage for this radical change? Once again, we must start with the children. The young child is the first great researcher. Children are born searching for and, therefore, researching the meaning of life, the meaning of the self in relation to others and to the world. (p. 2)

We reflected on the process of science taught in our youth, so often in opposition to this search for knowing, of using the scientific method to arrive at a predetermined conclusion. You ask questions, do research, construct a hypothesis, test it, analyze the data, arrive at a conclusion, and (if it is the conclusion that matches the one in the textbook) you have completed science.

Though in reality, science is messier. It is not linear. As we considered the methods we observe children use in their research, we also searched for discussions of the process of science held within the scientific community. Inviting the research of the community into our thinking is a vital element of contextual curriculum. Our search led us to encounter the project "Understanding Science" developed by the University of California Museum of Paleontology (2022) with the goal of fostering "a re-engagement with science that begins with teacher preparation and ends with broader public understanding." This model shows that you can enter the cycle at many points, and you should expect to go round and round, observing, asking, hypothesizing, and testing many times. According to their flowchart, "How Science Works," sometimes the steps are followed in order, sometimes they are not. You should expect to be impacted by the community, you should expect to look to prior research, and you should expect to be tossed about by serendipity. The only thing that is certain when embarking on this kind of work is that your work will be uncertain. This feels very similar to our approach to contextual curriculum, and when we approach science through this lens, scientific experiences become visible everywhere we look.

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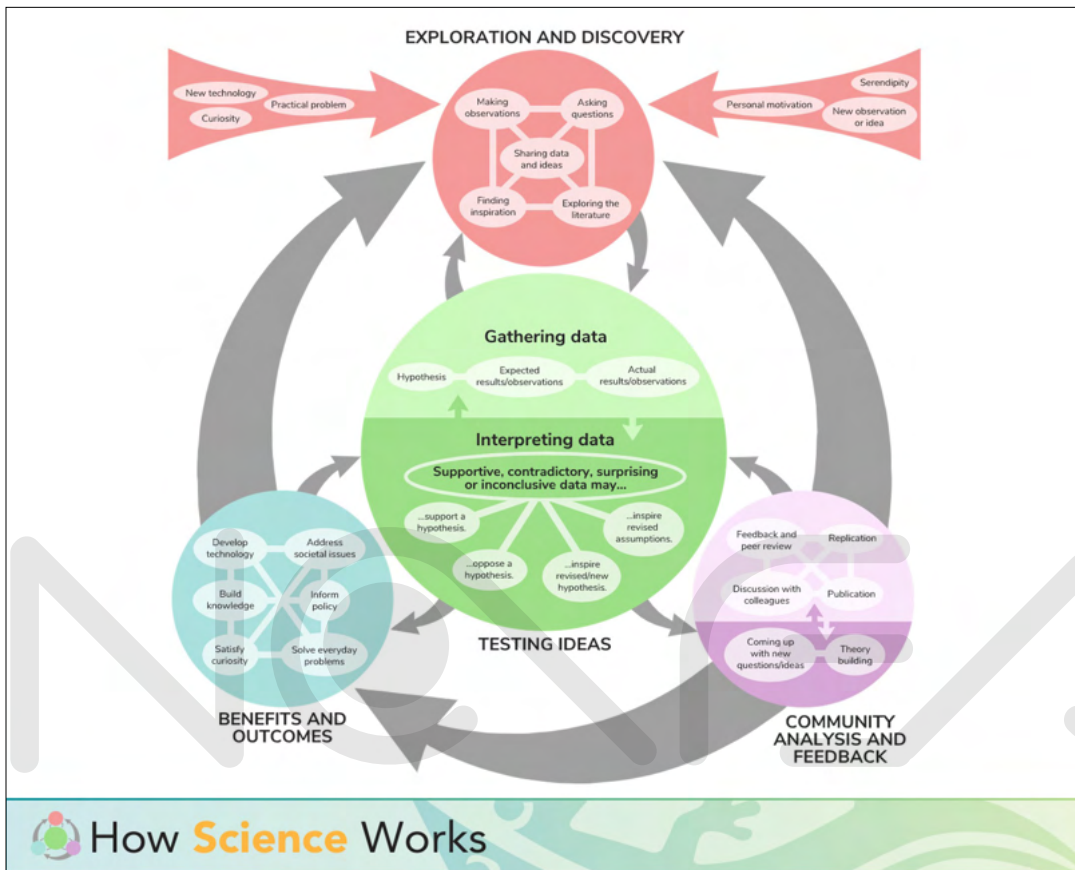
How science works flowchart

Often, young children engage in research that is not recognized by teachers whose notions of science are either formulaic, such as with the traditional model of the scientific method, or overly shaped by academic language. This model of science leaves out anyone who does not have the privilege of an academic background or access to "science focused" education. It feels crucial to reframe the definition of science for children and adults to reduce instances of gatekeeping. Brian L. Wright, author and professor of Early Childhood Education (2017), writes that "deciding what counts as 'scientific' is both informed and conditioned by teachers' expectations regarding what is an acceptable response to questions in terms of what constitutes scientific reasoning" (p. 213). Wright goes on to say,

"All students have the right to be educated using rigorous and relevant lessons, materials, and literature that situate their cultural and personal identities" (p. 217).

We often discuss that in the role of educator, our responsibilities include offering a space for democratic engagement. But what does that mean? Merriam-Webster defines democracy as "the absence of hereditary or arbitrary class distinctions or privileges" (n.d.). This seems to be what Professor Wright is discussing—by offering space for democratic engagement, the work can meet the learner where they are, rather than where we assume they should be based on our position of privilege. By creating an open platform for inquiry, each learner, of any age, has the opportunity to decon-

struct prior assumptions and reconstruct new understandings. Furthermore, by removing the stigma of what content is 'scientific' and what is not, we are able to welcome topics for research that can arise at any moment, even, as the "Understanding Science" flowchart notes, serendipitously.

David Hawkins, educational philosopher, physicist, and contemporary and thinking partner of Loris Malaguzzi, examined the role of serendipity when sharing the story of a bird that flew into a classroom. There were two possible paths to follow after this incident: the teacher could shoo the bird away and continue their unrelated lesson, or the teacher could embrace this diversion and be open to the questions, theories, and investigations that would inevitably arise. Hawkins (1974) reflected, "Somebody once said about great discoveries in science, 'Accidents happen to those that deserve them.' If the bird coming in is just a nuisance you don't deserve it" (p. 93).

The Fairy House: Our Bird in the Window

In the neighborhood surrounding Boulder Journey School, we have a treasure. It is a treasure that has been discovered by many different children and has sparked multiple threads and multiple journeys in multiple areas of research. To walk to one of our favorite parks, you walk right by a little plot of earth. It is a strip of grass and dirt between a small parking lot and a street. It would be insignificant, except a community of fairies and gnomes have taken up residence there in a dilapidated little house.

We are not sure when the fairy house was first built, or by whom, nor which class first discovered it. What we do know is that the following research was made possible by, as David Hawkins might have called it, a "deserved accident," the deconstruction of this little fairy house.

On a fairly warm Friday in December, the 2- and 3-year-old children of Room 10 went for a walk to "the park with the purple slide." As was their custom, they visited the fairy house and noticed that one of the walls had fallen down.

Discovery of broken wall

The children's discussion reflected their concern. How had the wall fallen? What tools would they need to fix the house?

Cole declared, "We need to fix it."
Smith offered, "Maybe a hammer."
"No," Cole replied, "that will break it."

The exchange reached no viable conclusion.

The weekend passed; the fairy house was still broken. Upon returning to school, the children reopened the conversation. When they posed the idea of creating a gift for the fairies, the teachers offered images from the walk and invited the children to draw possibilities for gifts in the margins. Evelynn added four additional figures to the edge of the image declaring, "She needs more fairies!"

The drawings demonstrated that the children were concerned with the fairies' lack of company, whether they were warm enough, if they had anything to play with, and if they were excited about upcoming holidays.

The children proposed a letter to deliver to the fairies: "Hello fairies! Do you need help fixing your house? Are you cold? We want to help! Do you want a present? Do you want Santa and a reindeer that pulls Santa? We love to visit your house."

When writing the letter, the dialogue naturally shifted from hypotheses of what the fairies might need (their house to be fixed) to questioning what the fairies might want (presents!).

Looking to the "Understanding Science" flowchart to guide an interpretation of this work, we can see that both the children and teachers were engaged in the beginnings of research.

Drawing fairies in the margins

> Side by side, teachers and children engaged in steps to uncover understandings of the world.

TABLE 1. BEGINNINGS OF RESEARCH

Children's Research		Teachers' Research	
Serendipity	The house is broken.	Gathering Data	The children are discussing the broken house.
Asking Questions	What should we do?	Hypothesis	The children are developing empathy for the imaginary creatures.
Gathering Data: Hypothesis	The fairies need our help.	Asking Questions	How do we support and deepen these empathetic connections?

The children were swept into the exploration and discovery phase by the serendipitous observation that the house was broken. From there, they developed a very initial question: What should we do? Through dialogue, the children began to gather data based on the hypothesis the fairies need our help.

At the same time, the teachers were engaged in research about the children. Observations of the children's discussions offered data that informed an initial hypothesis around their developing empathy for the imaginary creatures. From here, questions emerged to guide our exploration and discovery. How do we support and deepen these empathetic connections?

Side by side, teachers and children engaged in steps to uncover understandings of the world. If we accept Merriam-Webster's (n.d.) definition of "science" as the state of knowing, then this research is propelling the researchers towards a state of knowing: about the children in the class, the fairies in the garden, and the role of neighbors in the community. The rest of the week was spent researching fairies, their likes, their interests, and hypothesizing what might make the fairies happy.

Upon returning to the fairy garden, however, the wall was up! The house was fixed! The children's first hypothesis, that the fairies *needed* our help, came back unsubstantiated. The fairies had fixed their home without our help.

That did not deter the children. A new hypothesis was formed: perhaps the fairies *wanted* friendship. To experiment with this new hypothesis, the children presented their gifts to the fairies and gnomes. They decorated the garden with shells, flowers, and rocks.

"Let's make the flowers stand up, Smithy," said Parker.

"I'm gonna put mine in the ground. Right here," replied Smith.

Decorating the fairy garden

Looking again to the "Understanding Science" flowchart, we see that the children encountered contradictory data that inspired a new hypothesis: the fairies do not need help. This, in turn, led back to the exploration and discovery phase with the questions: Do the fairies want gifts? Do the fairies want friendship? Then back to the testing ideas phase to see how the fairies would respond to gifts that were left.

The teachers' research continued as well. The children's determination supported the teachers in developing an evolved hypothesis about empathy. This recognition that the fairies (or as the teachers understood, the neighbors) were actively engaged with the house emboldened the class to test new questions. What might happen if we leave gifts, items that were precious to the children, unsupervised in the neighborhood?

TABLE II. NEW RESEARCH QUESTIONS

Children's Research		Teachers' Research	
Contradictory data	The house is fixed.	Actual Observations	The children are still determined despite their initial dissonance.
Inspire a New Hypothesis	The fairies do not need help.		
Question	Do they want gifts? Friendship?	Hypothesis	Empathy is still present even when reactions are not as expected.
Testing Ideas	Leaving gifts for the fairies.	Testing Ideas	Leaving items, we have worked hard to craft in an unsupervised space.
Question	How will the fairies respond?		

If we understand a democratic space as a space without arbitrary hierarchies, then the children's shift from wanting to protect the fairies, who they perceived as 'in need,' to offering friendship to a group of neighbors, who they recognized as competent to rebuild their house, marked a shift towards a community with a more even playing field.

The experiment in friendship proved fruitful. Not long after leaving the children's note, a note from the gnomes and fairies awaited, inviting the class to please join in friendship. The energy and emotion were reciprocated. This was the start of another cycle—more observing, questioning, experimenting.

In the responding note, the gnomes and fairies asked the children for comfort which reignited the concerns about a lack of friends in the fairy garden. Using laminated photos to make figurines of the children, another venture to the fairy garden was planned. The children joyfully introduced the new photo figures to the fairy world, delighting in working with the miniaturized versions of themselves. The storyline with the new figurines focused on creating beds, covering the figures, and putting them to sleep. The children enthusiastically reminded each other to be very quiet so the figurines could rest. This became a prevalent line of research, which transferred

to play in the classroom as a spell of very cold weather limited the walks. The teachers actively observed the classroom work with a goal in mind: to capture moments of empathy or strands of play and dialogue that could be viewed through an empathy lens.

One day, as the class was walking through the halls of the school, Henry and Smith abruptly stopped to examine images of the school's pet guinea pigs on the wall. The children's excitement grew as plans to visit the guinea pigs materialized. This demonstrated the impact of community analysis and feedback. The work was able to continue because we exist within the context of the school community and can influence and be influenced by the work of other classes. How would the guinea pigs shape the work we were engrossed in?

Guinea pigs in hallway

Figurine friends for the fairies

TABLE III. RESEARCH QUESTIONS CONTINUED

Children's Research		Teachers' Research	
Benefits and Outcomes: Develop Technology	What structures are the most effective beds for our fairy friends?	Community Feedback	The school has guinea pigs – other creatures that offer relationship opportunities.
Benefits and Outcomes: Solve Everyday Problems	How do we ensure that we are caring for those that we love?	Actual Observations	The children are excited to investigate the school guinea pigs.
Benefits and outcomes: Address Societal Issues	There are people (and creatures) in this world that require extra support.	Hypothesis	Forming a relation-ship with the guinea pigs can support our fairy work.

The teachers introduced stuffed guinea pigs to the classroom and observed themes of care-taking. Myles fed a stuffed guinea pig water from a bottle, and Smith built a structure around the guinea pig's bed so it would be safe from the rain and bears. These interactions offered valuable data for proceeding in the investigation around the fairies. As had been the case with the fairies, the actions centered around bedtime and the creation of a func-tional home with walls and a roof and seem to reflect their understanding of basic human needs including food, shelter, and water, as well as more complex needs including enter-tainment and companionship.

In an effort to maintain momentum around the fairy house as winter weather continued, the children were invited to build a fairy garden inside the classroom. They immediately engaged in creating furniture and, more spe-cifically, beds. Hero declared, "I am covering them up because they are babies. I can do it because I have hands."

Designing and constructing beds demon-strated work in the benefits and outcomes phase of the "Understanding Science" flow-chart. Questions around technological developments in the engineering puzzles of construction were considered throughout the research around social and emotional issues.

Clay bed for the fairies

As we played with these ideas, another meta-phorical bird flew in our window. The weather had warmed up, and we took a walk one day, a walk that was meant to be almost routine, and we made a shocking discovery:

The fairy house was gone.

This discovery threw us into a state of disequi-librium. The treasured spot we had loved for so long became an emotionally dangerous place.

The teachers immediately considered creating a new house, but we did not want to rush into that. We knew we could not wrestle with this decision alone, as children and families were crucial protagonists in this work. The children engaged in conversations and developed hypotheses about what had happened and

Designing clay bed for fairies

how the fairies were feeling. "Are the gnomes and fairies happy?" asked the teachers. The children had many answers as they verbalized their empathy. Some said "yes," they love the dirt, and some said "no," they are upset. As we have often observed in children of this age, they expressed this love and empathy through the creation of tokens of friendship to offer the fairies in this time of transition.

It felt significant that the children did not express a drive to recreate the fairies' house for them. Upon reflection, it seems that the children were seeing and honoring the fairies' current reality, rather than focusing on what we, the adults, perceived the fairies to now lack.

The families expressed an interest in joining the children in creating gifts for the gnomes and fairies. Families were invited to a gift-making party to create clay items from a list of possible gifts that the children had brainstormed. The list included beds, of course, as those had always played a central role in the investigation, as well as friends for the fairies—other gnomes and fairies, as well as bug friends. And mushrooms! Our research into fairies showed many pictures that included

mushrooms, and so that became part of the canon of a fairyland for the children.

Jeremy Bendik-Keymer, professor in Ethics at Case Western University (2017), argues that the demonstration of people living, working, and getting through conflict together is a

Family gift making party

powerful act of political engagement. The class's research offered us a view of competent citizens coming together to support each other. We negotiated conflicting opinions and changed our perceptions of these groups (the gnomes and fairies) that had originally been perceived as helpless.

Loris Malaguzzi, founder of the Reggio Emilia Approach, established a philosophy of education as relationship. In her examination of this philosophy, Carolyn Edwards, professor of Psychology and Child, Youth, and Family Studies at University of Nebraska – Lincoln (1995), invites us to

> rethink the goals of participation in democratic school communities with respect to the developing individual. Instead of assuming that the purpose is to help that individual become an autonomous and self-regulated decision-maker (the "informed voter"), we need to start from the point of view that democratic citizenship is fundamentally about participation—becoming a protagonist in a group, a community whose participation is continually transformed by, and transforms, the directions and activities taken. (p. 11)

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Considering the Role of Photography and Digital Humanity

In any classroom guided by contextual curriculum, there are multiple threads of research that emerge simultaneously. While the children were holding the threads of research around empathy, they were simultaneously investigating the process of taking photographs. They photographed features of the outdoor classrooms—the stumps, the river of rocks, a rake—as well as each other. The teachers observed the children use the cameras to explore and deepen their relationship with the world.

As a school, we have been investigating the concept of Digital Humanity. How can digital experiences offer connection, construction, and creation rather than isolation? The act of taking photographs can be an individual engagement. We considered how to foster connection through offering prints of the photos to engage in non-digital photo manipulation. The children used a variety of mark making materials to impose marks over the original image—scribbles at first—and, over time, as they gained more control over their marks, they made stronger connections to the content of the photos.

Photography and photographic manipulation acted as an additional platform for the children to process understandings of the fairies' needs and wants. Photos from the research around gifts were manipulated and enhanced for the fantastical friends. Petra shared, "I'm drawing rain drips for them to drink because they don't have water bottles. I should draw water bottles. And rain drips. In case they forget their water bottle." From the elements added, we saw further evidence of the depth of thinking around emotional and physical needs.

In a democracy, it is crucial to go through a process of questioning and observing to deconstruct preconceived assumptions or biases that might have previously developed. Flexibility in thinking is a crucial characteristic to effectively engage in this process. By offering the children space to step in and out of their literal realities, are they developing flexible patterns of thought which can be transferred to later contexts?

Messing about with camera

Analog photo manipulation

During the cold spell that kept us indoors, the Boulder Journey School studio offered additional strategies to continue the work. There, the children encountered a series of invitations extending the work from walks to the fairy garden.

Large photographs were offered inviting manipulation like the experiences with small photos and markers, paint, and clay in the classroom. Petra was drawn to a paper-covered easel with a back-lit projection of a fairy house. She added a "fairy with really long arms" to the scene that was offered. Once the paper was removed from the easel, Petra observed that, while the fairy remained, the rest of the scene had vanished. New possibilities emerged in which a background could disappear.

Cole and Henry encountered figures of fairy-like creatures in front of a webcam that was projected onto a wall. They created temporary impressions, using three-dimensional objects to create two-dimensional images. Layers of complexity were added as large loose parts were added to "catch" a projection of a video

of one of the walks to the fairy house. This integration of reality-based video and fantasy-based narrative saw the fairies fly to work, to bed, to the moon.

This work with digital technology, in particular photography, invited us to consider the context of living in the age of social media, digital citizenship, and informed consent. Photography is a key player in these experiences, and we wondered how the children's uses of the medium would shape their relationship to these issues. The teachers asked, "How can we incorporate messages of respect and consent in our work?"

The children were encouraged to check in with each other before photographing another person. As the language of the camera grew more familiar, the children developed the phrases, "say cheese!" and "cheese" as a way to ask for and give consent. One day while photographing, Theo used the word "cheeses" as a way of requesting multiple pictures to be taken of him. This language also grew from their experiences with cameras outside of school.

The space between projector and projection

Photography as relationship

Sometimes, consent was denied, and the children had to navigate opposing preferences. Consider the following exchange:

Henry declared, "I took a picture of you, Smith!"

Smith replied, "I don't like that!"

The teacher asked, "Oh. What should we do about that, Henry?"

Henry thought for a moment and turned to Alice, "Can I take a picture of you?"

Henry seemed to acknowledge Smith's feelings and use that information as a foundation for asking consent before taking Alice's picture.

Coming into the research, the teachers had questions around children's perceived ownership with regards to their photographs. This line of questioning evolved to ask: How can we use photography to understand what community and respect already mean to the children?

STEM and Democracy

Jana Manaker, Boulder Journey School mentor teacher and member of the STEM group, defined stem as this: "STEM to me is a way of answering questions through observing, rede-

fining questions, exploring all avenues, using critical thinking and problem-solving skills individually and as part of a team."

This research into the fairy house has offered a lens for the process of developing, defining, and redefining questions and understandings through participation in a community of learners. But really, every experience that we offer space for can be a lens for these competencies. In this era, in which we see a tendency to act on assumption and immediate emotional reactions, in which we see choices being made for the benefit of the individual over the strength of the collective community, it is so crucial to create space to develop these competencies and to recognize their values.

And so, we return again to the concept of democracy and its relationship with education and with STEM. As we again looked to the community to strengthen our adult understandings, we encountered the American Democracy Project (ADP), an initiative designed to support civic participation at the higher education level, a goal aligned with the principle of participation outlined by Reggio Children in *Indications*, a set of fundamental principles which guide the choices and decisions within the schools in Reggio Emilia (2010). During their 2017 annual conference,

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the ADP identified a list of values necessary for democratic engagement. Among them are:

- Honesty - frankness with civility

- Curiosity - eagerness to learn, have new experiences

- Wisdom - comfort with complexity

- Imagination - creativity and vision

- Participation - action with other people to develop and achieve shared visions of the common good

- Resourcefulness - capacity to improvise, seek and gain knowledge, and solve problems

- Hope - belief in the power of people to bring about desired transformations (American Democracy Project, 2017)

All these values are also present when engaging in scientific inquiry. Our society has the tendency to value one way of thinking, often the linear way, and we shut out many of these values.

When Lauren Berry, mentor teacher in this class, initially reflected on the ways this work exemplifies connections between science and democracy, she was skeptical. She shared that in her daily work, she was focused on empathy development and did not see how this brought STEM into the classroom. By unpacking the documented experiences and deconstructing the work through the lens of this definition of science, it became clear. All along the way the children were engaged in questioning, observing, reflecting, analyzing, and experimenting, and all along the way they were deepening their relationships with the democratic values listed above.

Our beliefs about science impact children's engagement in science. Just as the Reggio Emilia Approach encourages us to reject the notion that education is neutral or that observation and assessment are neutral (Rinaldi, 2006), we can also reject the antiquated notion that science is neutral and embrace the ways that scientific inquiry helps us to consider issues of equity (Smith & Chao, 2018). Jerrold Zacharias, physicist and colleague of David Hawkins, said that the goal of science education is not to grow new scientists. Zacharias wrote, "I believed then, and I believe now, that in order to get people to be decent in the world, they have to have some kind of intellectual training that involves knowing Observation, Evidence, and the Basis for Belief" (Hein, 2013, p. 6).

It is this relationship between research and humanity that fuels us, although, we would disagree with Dr. Zacharias and argue that, rather than needing to provide intellectual *training*, children are already engaging in this way, and we have to hold a space where children do not become "untrained" from these competencies. As educators, we have the ultimate responsibility to hold that space.

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