Pacini-Ketchabaw, V., Kind, S., & Kocher, L. (2017). Thinking with Materials. In Encounters with materials in early childhood education (pp. 1-21). New York: Routledge.

1

THINKING WITH MATERIALS

In the early childhood classroom, educators and children gather around materials to investigate, negotiate, converse, and share. A block of clay, a brush, pots of paint, a brilliant sheet of paper, a heavy rectangular wooden block, a thin piece of willow charcoal—materials beckon and pull us in. They live, speak, gesture, and call to us. Materials can evoke memories, narrate stories, invite actions, and communicate ideas.

This book sets out to experiment with pedagogies of relationality that emerge when we encounter materials as active participants in early childhood education. Nothing in its pages acts as an appropriate model of practice. There is nothing to rehearse, nothing to appropriate. The book is about *encounters*. Encounters that are not necessarily good or bad. These are risky, worldly encounters that affect us, provoke us to think and feel, attach us to the world and detach us from it, force us into action, demand from us, prompt us to care, concern us, bring us into question.

Experimenting with these encounters entails nudging ourselves to experience them differently. We do not find, nor are we looking for, the meaning of these encounters. We are not concerned with their facts. We engage with each encounter as an event that demands its own questions, its own concerns, its own ethos. We inhabit each encounter. We are situated in each encounter's situatedness.

Eventful Material Relations

Encounters With Materials in Early Childhood Education aims to tell stories of what happens when we think *with* materials, when we choose to see materials as movements, as encounters, as assemblages, as ecologies, as time. Materials live in

the world in multiple ways (Bennett, 2004). In the chapters that follow, we think with five materials that are often found in early childhood spaces: paper, charcoal, paint, clay, and blocks. We treat these materials as active and participatory. They set things in motion, incite questions, produce ideas. In other words, they become productive moments.

Throughout the book, materials generate insights by provoking human and nonhuman others. We pay attention to a wide spectrum of forces and movements: how materials move through time and space; how materials move us, physically and emotionally; how time moves; how air moves; how bodies move; and more.

Thinking *with* materials transforms early childhood education, provoking educators to notice how materials and young children live entangled lives in classrooms, how they change each other through their mutual encounters. We are curious about the ways such a shift in perspective might change our interactions with materials, children, other educators—and perhaps even change the nature of our engagement with society and the world.

The greater goal of this book is to reassemble early childhood spaces as vibrant social-ecological-material-affective-discursive ecologies in which humans and nonhumans are always in relation. Relationality, therefore, is central to *Encounters With Materials.*

In this chapter, we tell stories of how materials are conceptualized in early childhood education and how we think of materials throughout this book. We outline the project this book is based on: what we did, the questions we asked, how we integrated materials through the arts, how we used video and photography. In other words, this chapter is where our theoretical and methodological frameworks are set into motion. Yet, this introduction is not written to support the book's structure. Like the book itself, it is written through diffractive movements to produce new possibilities.

Materials in Early Childhood

Engagements with materials are certainly not new in the early childhood literature. Since the 19th century, early childhood scholars have emphasized materials' importance for the development and education of young children. Frederick Froebel's gifts, the first educational toys developed in the 1800s, have marked materials' central role in early education (Prochner, 2011), but John Dewey (1897) reminded us more than a century ago that "the child's own instincts and powers furnish the material and give the starting point for all education" (art. 1, para. 3).

Today, scholars continue to highlight the importance of materials in young children's learning. Processes such as painting with a brush and working with clay are seen as activities that contribute to children's social, physical, emotional, and creative development (Golomb, 1992; Lowenfeld & Brittain, 1987; Matthews,

2003). The majority of texts available emphasize what to do with materials, yet say little about how one might think *with* them.

While movements have been made toward thinking of children's artistic explorations of materials as languages (Pelo, 2007), even early childhood centers that integrate the arts in their practices typically use developmental understandings of materials and artistic processes. There may be an interest and desire to engage with the arts as a visual language, yet without a depth of conceptual understanding, too often children's art is viewed as literal representations of self, experience, or knowledge. Materials are described as "bones" of curriculum (Carter & Curtis, 2007) in a developmental progression from exploration to representation. Often, instructions on how to organize and arrange materials are first provided so that children will learn the materials' properties and functions. Then, as they become more familiar with the materials, children are encouraged to use them to represent ideas and objects.

Pedagogues in the Reggio Emilia infant and preschool programs in northern Italy have paid close attention to materials, and philosophically complex ideas have been generated from their investigations of materiality (Ceppi & Zini, 2008; Friends of Reggio, 2004; Vecchi, 2010; Vecchi & Giudici, 2004). We see today a myriad of early childhood classrooms inspired by the practices in Reggio Emilia around materials (Callaghan, 2002; Fraser, 2006; Gerst, 1998, 2002, 2003; Kocher, 1999, 2004, 2009, 2010; MacDonald-Carlson, 1997, 2003; Rosen, 2009; Tarr, 2005; Tarr, Bjartveit, Kostiuk, & McCowan, 2009; Wien, 2008; Wong, 2006; Young, 2001).

We, too, have been greatly inspired by the Reggio Emilia pedagogical work. Despite the work's significance for our field's development, though, little of the Reggio-inspired early childhood literature focuses on how materials can take part in shaping ideas. This is the focus of our book.

The connections that *Encounters With Materials in Early Childhood Education* creates might surprise some readers. Instead of suggesting that carefully selected, beautifully organized materials be offered to children to experiment with and to represent their ideas and theories, this book thinks *with* materials—alongside them, listening to and caring for them, being with and being for things, exploring an ecology and ethics of things (Benso, 2000). We engage in thinking beyond instrumentalism, which reduces things to surface qualities and functions and treats materials as merely what mediates learning and developmental processes (e.g., Rule & Stewart, 2002; Trimis & Savva, 2009).

We investigate how materials "speak back" to children in agentic ways, extending and broadening the important body of knowledge on Reggio Emilia–inspired practices. Simultaneously, we generate original research to inform what Hillevi Lenz Taguchi (2010) refers to as an *intra-active pedagogy* that shifts attention from intra- and interpersonal relationships toward a material–discursive relationship among all living organisms and the material environment, such as objects and artifacts, spaces and places.

Encounters With Materials in Early Childhood Education challenges understandings of materials that define them from a scientific, rational, or functional viewpoint and through predictable properties of color, shape, density, mass, friction, and gravity. We contest deeply rooted cultural dichotomies—animate versus inanimate, active versus passive, and self versus other, to name a few (Bennett, 2010)—that lead us, often unconsciously, to think of ourselves as animate agents who act on passive, inanimate materials. We ask: What if humans' role in shaping materials is not as central as we believe? What if materials shape us as much as we shape them? What if we pay attention to the effects of things and to how things move together, not asking what an object or a thing or a material *is,* but what does a material *do*?

In this book, materials themselves propose particular possibilities. Materials do not just feel or act differently from each other, or have different properties, or produce different forms and images. They also provoke different ways of thinking as a child engages and works with them.

A block, for instance, is not just a tool for building. A block evokes particular ways of thinking, processing ideas, and making meaning that are profoundly different from the ways one works with paint, charcoal, paper, or clay, for example. In drawing a human figure or in using a camera to create a particular image of a person, the subject may be the same, yet engaging with different media and processes results in different perceptions and ways of thinking through the subject.

This means that how we think about materials shapes what is possible to do with them. For example, if we think of clay as a sculptural material used for making objects, that thought suggests certain engagements. We may set out individual slabs or balls of clay on a table and give directions or support in how to create particular objects. We may talk about form, texture, structure, and balance. We may subtly or directly encourage individual sculptural objects.

What we think clay is for shapes our experience with it, and the language we use to talk about the experience constructs particular meanings. If, on the other hand, we think about movement, place, impermanence, and relationality, then we may consider the possibility of moving toward and away from the clay, attending to the relationship of clay to its surroundings, and inviting interaction with others.

These concepts give structure to and shape the investigations with the material. And so we may set the clay out in other ways, for instance, as a big block in the center of a large mat on the floor, as several blocks stacked so they echo a child's height, in a space with several overhead projectors to facilitate a complex play of shadow, bodies, and movement. These various ways of setting out the clay do not just invite different interactions. They also shape what and how we see and the meanings we construct of the experience.

The "Material Encounters in Early Childhood Education" Project

This book works with pedagogical events collected through the "Material Encounters in Early Childhood Education" project, a visual ethnographic study conducted in two early childhood centers in Canada and supported by the Social Sciences and Humanities Research Council. The project's main goal has been to engage in an art-based collaborative inquiry to experiment with the complexities and possibilities of engaging with materials' relationality in early childhood spaces.

Inquiring Into Materiality

Over a period of three years, children, educators, and researchers became interested in what might happen to pedagogies when their focus is not solely on how children think about materials, or how materials should be presented to children, or what children's or educators' intentions are in relation to materials. Our focus became paying careful attention to materials in interaction. Through that process, we discovered that materials have a life of their own in classrooms and that these lives matter immensely for how we think and act in classrooms. We took materials seriously, not to romanticize them or to think of them as humans, but to attend to what they do when they participate in classrooms. We encountered each material as already filled with histories and stories, and also as an event that would allow us to ask questions and provoke inquiries.

In our weekly inquiries with children and educators, we asked: What does it mean to think *with* things? How does each material evoke particular invitations and provocations? How does each material live differently among/with/between other things and among/with/between young children? How are materials implicated in a classroom's movements? These questions framed our collaborations.

Experimentation

Materials, objects, places, and environments are inextricably bound to experimentation; thus, experimentation was key to our inquiries. The work of philosophers Gilles Deleuze and Félix Guattari (1987) helped us to conceptualize our experimentations with materials. Experimentation is a complex social-affective-political phenomenon that actively extends experience (Guattari, 1995). It opens up worlds and creates new venues for thinking and doing (Stengers, 2005). It reveals what human and nonhuman bodies can do and produce when they encounter each other. We embraced experimentation in our collaboration to transform life in the early childhood centers.

We committed ourselves to see encounters among materials, objects, places, and humans as part of the flow of experience. We created pedagogies that assume that we are never separate from the world, that we are made up of relations. Following Deleuze and Guattari, we conceptualized thought as experimentation: Thought creates itself through encounters. We experimented with the ideas that stories are told, forces are harnessed, and roles are performed through thought.

Through experimentation we discovered how something works by relations among the parts of assemblages, structures, flows, and connections. In this way we assumed teaching and learning as processes of creating what Deleuze and Guattari (1987) called lines of flight. By testing new and unpredictable mixes of bodies, forces, and things, we invented. Our process of inquiry into the unknown became embedded in the experimentation of experience, with all its unpredictable connections. Our experiments were not without risk, of course. Outcomes could never be predicted or known in advance. There was always the danger of reproducing the same, of decomposing one or more elements of an assemblage too quickly. Certainly, our project has been imperfect. It has been marked by struggle and, at times, resistance. The work has been slow, often challenging and unsettling. Yet, we committed to staying with the trouble, as Haraway (2008) suggests, that our experimentations brought to us.

Experimentation brought life to our sedimented early childhood discourses, increased our capacity to act in the world, and produced new forms of living (see O'Sullivan, 2006). It allowed us to open up perceptions and understandings of what is possible in the classroom. We engaged with children, materials, narratives, and each other as if they act on us and we act on them, entering into complex, entangled networks and assemblages—or, to use Lenz Taguchi's (2010) term, into intra-activity. We got to know the power, vibrancy, timeliness, possibilities, and consequences of a material.

This did not mean that we ignored children in our inquiries. We were interested in what children select, what they choose as desirable, and what they bring into their play. But we were also aware that experimentation does not only involve children's creative inventions. We worked within the tensions and ethics of listening to children's own concerns as we took seriously the materials and discourses children play with. We began from this question: How do children take the substance of their lives—the circulating images, narratives, and ideas—and make something of them, inventing, reproducing, transforming?

In the chapters that follow, we hope it becomes clearer how experimentation was encouraged in the early childhood centers, how the educators looked for ways to provoke and facilitate experimentation, how "problems" were worked with and not "managed," how most of the work that took place in the classrooms was collective and not "owned" by particular children. Through pedagogical experimentation, we aimed to create a collective context so that it was never about what individual children did, rather how we could invent together.

The Arts as Mode of Inquiry

Our collective experimentations with materials emerged through our interest in the arts. In the "Material Encounters in Early Childhood Education" project, the arts were not superfluous additions, teacher-directed activities, or even idealized examples of children's inner worlds or creativity. Instead, they were seen as integral aspects of children's daily inquiries, explorations, and learning. Art was a puzzle, a question, an encounter. As Claire Colebrook (2002) reminds us, like inquiry and research,

> art is not about knowledge, conveying "meanings" or providing information. Art is not just an ornament or style used to make data more palatable or consumable. Art may well have meanings or messages, but what makes it art is not its content but its *affect*, the sensible force or style through which it produces content.
>
> *(pp. 24–25, emphasis in original)*

Part of what art does is ask us to attend to things. It draws our attention, often to new things, or to older things said or presented in new ways. Basically, art asks us to make sense of things, or to figure them out.

As we mentioned earlier, integrating the arts into our project was not always easy. It is a commonly held misconception that art should be easy—that an artwork emerges effortlessly in a singular moment of inspiration, or that an artist knows the work in advance and an idea comes into his or her mind fully formed. There is often a large difference between an artist's idea and the realization of that idea in paint, charcoal, or clay. The process of working through an idea is not straightforward, as if the materials merely illustrate a mental image; rather, there is a dynamic interaction of thought and image, and both are shaped in the process of creating. Shaun McNiff (2008), for example, writes:

> Artistic inquiry, whether it is within the context of research or an individual person's creative expression, typically starts with the realization that you cannot define the final outcome when you are planning to do the work. . . . In the creative process, the most meaningful insights often come by surprise, unexpectedly, and even against the will of the creator.
>
> *(p. 40)*

Art also relies on failures, mistakes, and disjunctures (Kind, 2007). As Alain Toumayayan (2004) describes, artistic inspiration is a "consequence of failure . . . an accomplishment which exceeds one's powers of conception, planning and execution" (p. 93). Thus, to create is to step into the unknown with improvisation at the heart of the endeavor. Failure, struggle, uncertainty, and not knowing the outcomes in advance were at times difficult concepts for educators to embrace, yet these are essential elements of artistic practice.

Drawing on the work of Guattari (1995) and Bennett (2010), Springgay and Rotas (2014) write about classroom art as more than giving children an opportunity to explore or to have a sensory experience:

> In thinking a classroom as art, Guattari (1995) is not referring to institutionalized art but to the ethico-aesthetic paradigm, where mutant compositions will "not simply attempt to preserve the endangered species of cultural life but equally to engender conditions for the creation and development of unprecedented formations of subjectivity that have never been seen and never felt" (p. 91). Disrupting reductive practices that enforce specific ways of doing curriculum (i.e., laws and codes), the classroom as art, as an ecology—an ethico-political enunciation—"is an activity of unframing" (p. 131); a way of living differently both in schools/life, but also differently living research, vital research "which refuses to dissolve completely into the milieu of human knowledge" (Bennett, 2010, p. 3).
>
> *(Springgay & Rotas, 2014, p. 563)*

When art is understood materially, as an affective event, it becomes irreducible to function, form, and technique. In our project, it became a force of relations that made learning felt and inarticulable—in excess of language. As Springgay and Rotas put it, art became a social practice. Children were creating and were invited into thought.

The Studio

The art studio was an important element in our experimentations. The studio itself emerged and shifted through and with the project. It took many different forms and was created differently in each early childhood center at different times. In one center, we claimed a small area of a resource room that was connected to the early childhood education students' classroom, and it became a dedicated studio space. In another center, we transformed the atrium into a studio. The forest became an art studio, as did a river. Yet, we never fully defined what the studio was supposed to be. We stayed close to the idea of "not yet." We wanted to follow the rhythms and movements of the studio and wonder, What is the studio? rather than know in advance what it was or should be. Each studio evolved slowly.

In the studio, we questioned rather than accepted what things were. We asked, "What is (a) painting?" rather than trying to facilitate or plan painting projects. We held back for a while on an emphasis on what the marks and imagery represented, and attended instead to how our understanding and perception of the processes could be enlarged and altered. We wondered: When does a painting begin? When does it end? What are the rituals, rhythms, and tempo of painting?

And we experimented, sometimes rather wildly, with materials. We spent months in intense experimentation with charcoal, encounters that connected

rooms, teachers, and children across the center and left resonances and traces throughout the space. And there were many other experiments as we explored, for instance, the intersections of body, dance, and painting, stretching the possibilities and feeling a sense of the lived/living relationships of body-material-surface-and-space. We watched how paint, fingers, and brush transformed the paper, or how the paint moved from easel to window, or how the light played with the paint, trees, and plexiglass painting surface when we painted.

We paid attention to how clay, when rolled into a ball, seemed to want to move along the floor or be carried around in buckets. We watched the choreography of bodies, paintbrushes, and containers of paint moving in and out and around surfaces. We attended to rituals of painting and washing, covering and recovering. We noticed and responded to how the paint colors or the clay echoed with the trees, sky, weather, and earth. And of course, as we paid attention to these things, we began to shift how we thought about, talked about, valued, and responded to children, the materials, and artistic processes.

The studio invited us to slow down, to listen to the intricate visual and sensorial details, to attend to the particularity or the "thingness" of things, and to treat things tenderly and gently. The studio was a quiet place where children could pause with us to notice the materials' movements and invitations, to follow the sounds of their drawings, to negotiate ideas, to follow lines of thought, to be with, or dwell with, ideas, processes, and materials. We hoped to develop a more textured and descriptive artistic language and a space where we could work well with delicate and fragile materials in addition to strong and robust ones so that our movements and encounters with materials, spaces, surfaces, and processes could be multifaceted, complex, and full of life.

The indoor studios at first were quite empty: one glass brick wall; a clock (which has since been put away); one or two low tables; small chairs; a selection of pods, seeds, sticks, barks, and branches; rolls of paper; and various drawing media. The studio was not a rigid place, a container for creative acts and materials, but an emergent space itself inherently creative and creating. We were not interested in filling the room, preparing it, or creating a specified "art space." We wanted to see how the studio would take shape in its use.

The studio became a place to dwell. Tim Ingold (2011), borrowing from both Heidegger and Marx, frames the difference between building and dwelling. Builders use plans, drawings, and a framework for what they are about to build, so a built form is the outcome of a prior design. Dwelling, by contrast, Ingold writes, "is intransitive: it is about the way inhabitants, singly and together, produce their own lives, and like life, it carries on" (p. 10). Dwelling, then, is not just about occupying structures. It is about being immersed in the currents of the lifeworld. Humans, of course, do build things. But the idea of dwelling takes into account processes of working with materials and not just doing something to them, and of being part of the emergent processes of bringing something into being.

We settled into an easy rhythm in the studio. At times it was a lively space, full of activity, and at times it appeared still, with just the materials. Yet even in

the room's "emptiness" things were always moving: the drawings on the wall, hanging sculptures of leaves and twigs, the diffused sunlight coming through the glass bricks changing with the time of day and the weather. The seedpods and leaves moved slowly and almost imperceptibly, but were still in processes of decay, drying, curling, occasionally picking up the faint breeze from the circulation of air in the room. Ingold (2011), discussing Merleau-Ponty's concept of perception and the sentient world, writes:

> To be sentient . . . is to open up to a world, to yield to its embrace, and to resonate in one's inner being to its illuminations and reverberations . . . the sentient body, at once both perceiver and producer, traces the paths of the world's becoming in the very course of contributing to its renewal.
> *(p. 12)*

The room itself invited us to open up to a world of beauty, artistry, and wonder.

When in the studio, we became much more attentive and deliberate in our attention. The studio took on a new intensity as we looked at the intra-activity of materials, children, spaces, places, and bodies. We became curious about how materials move within and between the studio and the rooms in the center, and we have experimented, invented, played with, and taken time to dwell with materials like paper.

We still do not know what the studio is. It is an idea. It takes shape, sometimes temporarily outside in the field or in the forest, and it is characterized by forces and energies rather than places, rooms, and walls. We know we needed the room or the space to remind us, and others, that the work existed. The space also allowed for pauses and times of dwelling with ideas. But the studio itself, the room or the space, was only part of the project. Over time it became more like a verb, an action and acting, a function and collection of rhythms of movements. It took shape, moving, changing, becoming when we gathered to listen, watch, question, respond, invent, and experiment. It held a great sense of anticipation.

Our experimentations in the studios have been somewhat risky and often messy encounters, yet ones full of joy and adventure. The traces of these explorations still resonate and are felt in the studios.

Encounters With Materials *and the Reggio Emilia Project*

This book would be incomplete if we did not include further commentary on the connections between our project and the artistic project of the Reggio Emilia infant and preschool programs (http://www.reggiochildren.it/?lang=en). We are indebted to their important work. Yet, we do not conceptualize our work as following a Reggio Emilia approach to early childhood.

Jonah Lehrer (2012), in his book *Imagine*, discusses Bob Dylan's process of composing. He describes how Dylan understands his creative process as one of love and theft, and how it begins when he finds a sound or song that "touches

the bone" (p. 246). Through close study he then tries to deconstruct the sound to figure out how it works. In the same way, the studio work in Reggio Emilia has "touched the bone" of countless early childhood educators. So many of us have been inspired by how the Reggio educators have embraced the arts as central to children's learning processes. They have engaged with the arts, not as an add-on or extra, a subject of study, or even a brief experiment, but as a deep, sustained commitment to artistic ways of knowing and being. In doing so they have shown that the studio, or atelier, and the atelierista are at the heart of learning (Vecchi, 2010). Their work continues to remind us that learning has an aesthetic dimension and that beauty matters.

Howard Canatella (2006), Stuart Richmond (2004), Elaine Scarry (1999), and Joe Winston (2008) each propose that a delight in beauty should be at the core of education. The arts, Maxine Greene (1984) argues, are unique and necessary in that they transfigure the commonplace and open up unique dimensions. The languages and images we find in art "make perceptible, visible, and audible that which is no longer or not yet perceived, said, or heard in everyday life" (Marcuse, quoted in Greene, 1984, p. 129). The arts allow for a pedagogy of intensity and affect; they open us to the unexpected and the possibility of the "not yet" (see also Vecchi, 2010). It is impossible not to acknowledge that the work in Reggio Emilia has touched the bone, and the heart, of our project.

However, we started our project, and we wrote this book, in response to our concern with what is taking place in North American early childhood education with relation to Reggio Emilia's project. Our concern is in how the Reggio philosophy is often approached. In Reggio-inspired schools and practices, there is a tendency to try to make things look like Reggio rather than trying, as Lehrer describes, to figure out how things work. Perhaps there is nothing wrong with imitation. Many good ideas are born from copying, borrowing, or replicating, and as Scarry (1999) writes, these are some of the effects of beauty. She emphasizes that beauty has the ability to inspire and "brings copies of itself into being" (p. 3). But our interest is in doing more than simply bringing copies of Reggio into being—not just because the work has to find its own expression here, but because Reggio imitation frames the studio as something already known, with the process primarily implementing an already-known idea. Imitation misses the "not yet" of art.

Inviting Conversations Through Images

As a visual ethnography, images were central to our encounters with materials. We used images to open possibilities for different ways of knowing and to express and articulate thought. The visuals set the thinking in motion and our thought provoked the visuals. Yet in this book, we include very few of the hundreds of images we collected.

We have developed a companion website to the book that extends the ideas engaged in Chapters 2–6 through photos and film. Photography, film, and text are three events that allow us to create new terrains of engagement and to generate

pedagogical possibilities. Each event requires different sensitivities and approaches, and each offers distinctive understandings of social realities. The question that framed the purpose of the companion website is the same as what we hoped to investigate in the project: How might we create worlds with images? For us, images offered an affective and aesthetic dimension that is also paramount in this book. Film and filming represented not just the act of seeing or the photographer's perspective, but a rich sensory, relational, gestural, and emotional experience. Photographs and other visual images on the website aid in understanding the nonverbal, the not easily articulated, the multimodal, the multidimensional. We invite readers to visit the website when reading the book: www.encounterswithmaterials.com.

By no means do the visuals act as an illustration of the narratives included in the book. Likewise, in both the book and on the companion website, the visuals are not records of what happened in our inquiries. We deliberately set out to pay attention to what paper, charcoal, paint, clay, and blocks might *do* and to imagine something other than meaning residing in children's understandings, words, and actions.

FIGURE 1.1 Through the eye of the camera
Sylvia Kind, Author

Associating photography with the real, tangible, objective world is in many respects a dangerous gaze. Photography is often understood to be an imprint of reality or an "unmediated copy of the real world" (Sturken & Cartwright, 2009, p. 17). Susan Sontag (1977), for instance, once described a photograph as "not only an image (as a painting is an image), an interpretation of the real; it is also a trace, something directly stenciled off the real, like footprints or a death mask" (p. 154).

One of the challenges we encountered in our project was to think outside of representation, of what images mean. Photography assumes a privileged relationship with and responsibility to reality because a photograph, particularly in film photography, acts as proof of an object's existence. The object must have been there, the event must have happened, or else "there would be no light reflected from it and no form for the negative to capture" (Navab, 2001, p. 76). A photograph, then, is evidence of a real, tangible world: It visualizes, or makes visible, something about the world as it is seen or experienced.

In early childhood contexts, we can see this idea of representation in practices where photography is used to help make visible a child's interior world and gain insight into children's lives, concerns, and experiences (Clark, 2005; Close, 2007; Richards, 2009; Thompson, 2008). While photos may reflect or in some way allude to what is happening in children's minds and lives, the representational focus tends to emphasize the passivity of the world and the agency of the subject who perceives. As Rose (2004) writes, it assumes that the "self" is the pole of activity, presence, and power and that the "other" is the pole of passivity (p. 20).

Whether a photograph is considered to be an accurate or even a constructed representation, the camera is most often considered a passive instrument or a tool in the hands of the photographer. The camera, a machine, does what it is programmed to do. To look through the lens is to objectively capture the world, and to be objective generally means detachment and disentanglement. But as Law (2004), discussing Haraway, writes, detachment is never possible because we are always caught up "in a dense material-semiotic network. . . . We are entangled in our flesh, in our versions of vision, and in relations of power that pass through and are articulated by us. So detachment is impossible" (p. 68).

In our research we did not use the camera as a passive machine, a "reasonable" tool, or an objective instrument. Each image in this book and on the website circulates in relation to other images, in relation to the viewer's own subjectivity and ways of seeing, and in relation to contexts, cultures, and histories. Images and objects are entangled in complex semiotic webs. We are interested, as Rose (2004) writes, in embracing "noisy and unruly processes capable of finding dialogue with each other and with the world . . . a dialogue that requires a 'we' who share a time and space of attentiveness" (p. 21). We see photography as a process of collaborating and moving *with* the world, a between-space, rather than a view from either outside or inside. As Haraway (1988) describes, we experiment with a vision that refuses indisputable

recordings of what is simply there. Thus, our purpose in including photos from our ethnography in the book is to bring images into conversations. We work with the images as propositions for further experimentation. We engage in a process of diffraction.

Diffraction as a Mode of Inquiry

As it might have become clear to the reader by now, this book does not include reflections on the pedagogical moments that took place during the project. We do not recount what took place in those moments to understand children's meanings or to deconstruct pedagogies. We diffract.

Drawing on physicist Karen Barad's (2007, 2011) ideas, we work with diffraction, as opposed to reflection, as a way of thinking with materials in this book. Reflection is similar to *representationalism*—an idea we inherited from the Enlightenment. Representationalism is the belief that the world can be perfectly represented (reflected) through rigorous epistemological acts of Truth and the establishment of rigid boundaries delineating difference. In other words, Truth represents a single, neatly bounded Reality. Diffraction, by contrast, coincides with *performativity*, a direct material engagement with the world that does not hold subjects and objects strictly apart, but instead understands the world in intra-acting phenomena. Reflection and diffraction offer very different ways of looking at—or rather, being in and with—the world.

Because we find diffraction to be generative of thought, pedagogical moments within each chapter are not told in sequence as if they tell the story of what happened. They do not follow a logical structure. We do not analyze the moments for meaning, nor do we tell stories to be imitated. We produce something new with the pedagogical moments. We are interested in how the moments help us think differently about materials and materiality. How they help us make a difference. Create new worlds (Haraway, 2008). Shift our attention (Latour, 2005a). Generate thought through concepts.

Diffracting With Concepts

As Thiele (2014) explains, in a thought-practice, "concepts are not abstraction *from* the world, but an active force *of* this world—and thus always/already implicated in and concerned with world(ing): practicing *and* envisioning specific practices for this world" (p. 203, emphasis in original). As ways of worlding, these concepts are merely acts, not explanations. Brian Massumi (1987) reminds us that "a concept is a brick" that "can be used to build the courthouse of reason" or "can be thrown through the window" (p. 173). We hope the concepts and materials in this book do not become routines or procedures to master

and repeat, but become invitations to think pedagogy otherwise. Invitations to create new concepts, to matter new worlds through materials. A concept, to paraphrase Stengers (2005), is a technique and a force of thinking that allows us to grasp new details and transform both ourselves and our modes of engagement.

The concepts we selected to think with are then connected to other concepts that help us extend our thoughts. All of these concepts have emerged from our theoretical inspirations. This book, like the project it emerged from, is inspired by the relational ontologies and more-than-human onto-epistemologies advanced by numerous environmental humanities scholars, philosophers, science studies researchers, anthropologists, cultural geographers, artists, and others (e.g., Barad, 2007, 2011; Bennett, 2004, 2010; Deleuze & Guattari, 1987; Haraway, 2008, 2015; Ingold, 2011, 2013; Law, 2004; Oates, n.d.; O'Sullivan, 2006; Puig de la Bellacasa, 2015; Rose, 2004; Springgay, 2011, 2012; Stengers, 2015; Tsing, 2005, 2011, 2012, 2013; van Dooren, 2014; van Dooren & Rose, forthcoming; Wolseley, 2016; Zhang, n.d., 2009) who want to change materials' humanist and capitalist story—a story that has entailed rampantly accumulating materials and then trashing them in quantities sufficient to poison and endanger our planet.

This Book's Entanglements With Paper, Charcoal, Paint, Clay, and Blocks

The book is organized by materials. Each chapter engages with a material that became important in the classrooms we collaborated with. Yet, the chapters do not explain the materials. Instead, each chapter connects itself (diffracts) to concepts to think about pedagogy differently with materials. Inspired by Thiele (2014), we *think-practice* with the materials as we write about them, following concepts in order to enable thought. The materials and the concepts are as follows:

- paper: movement
- charcoal: encounter
- paint: assemblage
- clay: ecologies
- blocks: time

In Chapter 2 we begin with the paper we write on to tell stories of how materials are caught up in the world's flows, rhythms, and intensities (Pacini-Ketchabaw, 2010). What do paper's versatility, variety, deceptive strength, and precarious fragility set in motion as paper interacts with the movements of the world? To explore this question, we attend to both the surface of paper and to paper as surface to generate moments with which to work and think. How might we

FIGURE 1.2 Tear, rip, paste, consider, sway

Sylvia Kind, Author

look at paper in ways that open our imaginations? How does paper play into our thinking? We pay attention to what paper does: sticking itself onto children's bodies, flying in the air of the classroom, freely venturing into hallways, blanketing surfaces, becoming particular (and not just being paper in its generality). We decide to play and exaggerate paper's ability to be caught up in the movement of air. Things happen: Children join in, as do we, as do trees, vents, fans. The paper responds. Everything and everyone responds. And new questions emerge.

We encounter charcoal in Chapter 3, and all of a sudden things become unrecognizable. We experiment with how charcoal covers and uncovers as a way of generating possibilities for telling stories in new ways. We wonder: How do we tell stories? What histories emerge in the ways we tell stories? What histories are not seen through the charcoal or our camera's lens? What marks does charcoal leave in the stories we tell? What marks are never uncovered? What is framed

FIGURE 1.3 Grind, crush, growl, howl, excavate, unearth
Sylvia Kind, Author

when charcoal covers and when things become uncovered? How can we tell stories through the residue charcoal leaves everywhere? For instance, we might tell stories differently if we wanted to recognize the marks charcoal leaves behind on bodies or in forests or in trees, nails, clothing, or in us, or in educators, or, or, or. And importantly, what does charcoal set in motion when we play with charcoal's movements of covering and uncovering?

Paint oozes through Chapter 4 and assembles new actions. Here we become interested in the invitations paint provokes and what is generated through them. How does paint invite other materials, and children, to respond? Paint on the floor, on easels, on walls, on bodies, on brushes invites different actions, different movements, different ways of being and becoming. How children and how other materials respond to paint's provocations also differs as each participates in the process. Nothing is predictable or set. Possibilities are endless. Yet, histories are

FIGURE 1.4 Mix, dab, stab, pat, stroke, flick, laugh

Sylvia Kind, Author

roused through these invitations, and these histories constrain and shape encounters with paint. We use these constraints as spaces of generation. Paint becomes an event that acts by materializing its viscosity, smoothness, and slipperiness throughout the classroom in relation to other things. Paint invites the reader to think with it and to do something with it.

Clay molds and shapes Chapter 5. Our interest here is when clay becomes clay, when a material becomes a material through its trajectory. We also want to discover how clay acts and interacts in ecologies: on the ground in the forest, when it is scooped from the river, when it enters the studio. We think about clay's demands: when we look at the final product that has been shaped, when the clay goes back to the earth after we have encountered it, when it responds to our movements as we work with it, when it refuses to stay still in one shape, when it flows through the studio in rhythm with children's movements, when it is cured through intense high heat. We follow the shapes that emerge as clay

FIGURE 1.5 Scrub, rub, wobble, trickle, melt

Sylvia Kind, Author

intra-acts with the children, the transformations clay constantly invites through its easy malleability and its ability to slow things down when it comes into contact with air and dries. We follow clay's unexpected movements as it interacts with shoes, with pockets, with hands, with boots, pine needles, water, rocks, twigs. As we follow clay, again, we generate questions.

Wooden blocks construct Chapter 6 as they become in interaction with time, sticks, tubes, chairs, buckets, plasticine, paper, children. We engage with two questions: What happens when we pay close attention to what blocks do? What does paying attention to blocks in interaction with other things set in motion? We quickly become curious about the stability and stationary condition of wooden blocks and begin to work with their movements to upset their stability. Attending to the ways blocks move and to the forces that constrain their movements, we cannot help but notice daily rhythms and the stillness and intensity

of moments. Blocks move differently at different times, and time is lived differently with blocks. So time becomes another material to engage with.

Chapters 2 through 6 relate to and with each other. All the ideas are entangled. For instance, although Chapter 2 looks at paper through movement, the other concepts we engage are still at play. Chapter 3 looks at the concept of encounter through charcoal, but movement is still an important part of it. And so on. Thus, ideas repeat and concepts are interwoven, but particular things are brought more fully into view in each chapter.

The materials all come together in an afterword where we tell a brief story of the pedagogy of noticing. What happens when we notice and attend to materials' entanglements? What happens when we allow more and more things to enter our pedagogies? Might noticing materials in *relations* open possibilities for early childhood pedagogies?

FIGURE 1.6 Stack, clack, whack, knock, topple, fall, look

Sylvia Kind, Author

Now, we begin experimenting, inventing, playing with, and taking time to dwell with materials such as paper. As we played with paper, our thoughts took on its characteristics and became a lot like paper: transformable, not containable, flighty, at times airborne, malleable, multiplying, spreading. Paper became ordinary yet magical in its effects as educators and children joined together in movement.