When Paint Becomes Glue

Emergent Scientific Inquiry, Wonder, and Relational Meaning-Making in a Japanese Nursery School

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Abstract

In contemporary early childhood education, scientific inquiry is often framed as a structured process driven by explicit questions and directed toward predetermined outcomes. Such a perspective risks overlooking the subtle and relational ways in which inquiry emerges in children's everyday experiences. This study re-examines early scientific inquiry as a process of relational meaning-making, drawing on J. C. Smuts' theory of holism and Tim Ingold's concept of meshwork.

Adopting an active participant observation approach, the author engaged in a Japanese nursery school. The researcher's shifting positionality became an analytic lens, moving from a managerial "apron uncle" toward a "science uncle," a role through which the researcher reflexively reconnected his background as a science educator with his responsiveness to children's emergent inquiry. Across episodes involving color water, light, slime, insects, chromatography-like play, and bodily sensations, these everyday encounters are understood as moments in which children's relationships with materials, bodies, and others, and the researcher's way of attending to those relationships, were momentarily unsettled and reconfigured.

Using an analytical framework of event, response, mediation, and reflection, four key claims are advanced: (1) inquiry often begins not with predefined questions but with unexpected material transformations or even comic disruptions; (2) adult responses - such as waiting, attuning, reframing, and asking for children's own explanations - can either open or close emergent inquiry; (3) materials function as co-participants that sustain attention and invite further exploration; and (4) reflection emerges dynamically through repetition, comparison, retelling, and redesign rather than through formal explanation alone.

From this perspective, inquiry is not a linear progression from question to answer, but an ongoing process of becoming within a meshwork of relationships. Meaning is not discovered as a fixed entity but generated through embodied action, interaction, and continual reinterpretation. This study reconceptualizes early scientific inquiry as a holistic, relational, and emergent process, highlighting the

pedagogical significance of everyday encounters in which familiar relations are unsettled, and inquiry begins to take shape.

Keywords: *holistic education; early childhood education; scientific inquiry; active participant observation; wonder*

Recent debates in education have raised concerns about reducing educational value to measurable outcomes and comparable indicators (Biesta, 2009). Within early childhood education, related debates have questioned standardized international assessments of young children's learning and the assumptions such assessments may carry (Moss et al., 2016). These concerns do not mean that evidence, description, or careful observation are unimportant. Rather, they suggest that when learning is recognized only through predetermined outcomes, other forms of attention, relation, and meaning-making may be overlooked. This study begins from this concern and asks how early scientific inquiry can be recognized when it emerges through children's lived encounters rather than through formal procedures alone.

In many educational settings, scientific inquiry is described as a sequence: a question is posed, a hypothesis is formed, observations are made, evidence is evaluated, and a conclusion is drawn. This sequence has obvious pedagogical value, especially in formal school science. Yet it can become limiting when it is treated as the only recognizable form of inquiry. In early childhood settings, children often begin elsewhere. They are pulled by a shifting color, a sticky texture, a joke about a body part, a tool that suddenly behaves differently, or a material that refuses to do what it did a moment ago. Their inquiries are frequently embodied before they are verbal, relational before they are individually articulated, and exploratory before they are organized into a formal "research question."

In this article, I use wonder as a sensitizing term rather than as a separate theoretical framework. Keltner's (2024) account of awe as everyday wonder offers a useful contemporary reference point for attending to small encounters that can momentarily alter one's relation to the world. Here, wonder helps name moments in which familiar relations among children, materials, bodies, and adults become unsettled enough for inquiry to begin taking shape. The main analytical work, however, is carried by the sequence of event, response, mediation, and reflection.

This article begins from the conviction that such episodes should not be read merely as pre-scientific play or as immature versions of "real" inquiry. Rather, they should be approached as meaningful sites in which children are already learning how to attend to the world, how to stay with an event, how to compare what happened with what was expected, and how to recruit others - children, adults, books, tools, containers, light, paper, and time itself - into the making of sense. If we begin from the child's lived encounter rather than from a school-science template, different features of inquiry come into view.

My concern is therefore not whether young children have mastered the procedures of institutional science. The question is how inquiry emerges in the midst of nursery-school life, and how adults might notice and sustain it without prematurely closing it down. The setting of this study made that question especially visible. In a Japanese nursery school organized around mixed-age play, children's investigations moved continually across everyday materials, humor, bodily knowledge, social negotiation, and spontaneous experimentation. The challenge was not to "insert" science into the setting, but to learn

how to recognize scientific inquiry in forms that did not always look like school science.

Existing research has already shown that young children engage in explanation-making, comparison, and sustained exploration in everyday settings. Work in Reggio Emilia-inspired classrooms, for example, has documented children's inquiry around natural phenomena through materials, observation, and collaborative talk (Inan et al., 2010). Studies in Japan have likewise traced emergent scientific thinking in preschool play involving color, light, and everyday materials (Kato, 2013; Ohnuki, 2016). What remains underdeveloped, however, is a language for describing how such inquiry is generated relationally and holistically in the moment of practice, especially when it is not yet stabilized into school-like procedures.

The article makes this argument in two steps. First, it offers a relational and holistic framework for understanding early scientific inquiry. Second, it presents fieldwork episodes showing how inquiry emerged around color water, tools, bodily questions, slime, insects, and chromatography-like play. Throughout, I use four research questions as orienting threads: How do adult-child relationships open or suppress emergent inquiry? Under what conditions do questions arise? Under what conditions does observation deepen? Under what conditions do experimental actions become possible? These questions are not treated as independent variables. They are interwoven dimensions of one ongoing process.

Conceptual Orientation: Holism, Meshwork, and Emergent Inquiry

The conceptual starting point of this study is holism. Smuts (1926) used the term to resist explanations that reduce living processes to isolated parts. A holistic orientation does not deny detail; rather, it asks how detail gains meaning within a living whole. In early childhood inquiry, this matters because a child's attention is rarely purely cognitive. Curiosity is braided with sensation, affect, prior experience, social recognition, and the possibilities afforded by materials. A comment such as "It turned pink," a child's remark about nose hair, or "Paint can be glue" cannot be understood only as a statement to be evaluated for correctness. It is also an event within a larger field of relations.

Ingold's work offers a second orientation. For Ingold (2014, 2018), life unfolds not as a set of detached objects but as lines of movement, attention, and relation that become entangled in a meshwork. This language is especially generative for early childhood research because children do not approach materials from the outside. They move with them. Their understanding develops through touching, pouring, peering, comparing, imitating, naming, carrying, arranging, and returning. Inquiry, in this view, is less a linear sequence than a path of wayfaring. It advances through detours, pauses, recursions, and crossings.

This perspective resonates with research on early scientific reasoning that emphasizes the mutual relation between explanation and exploration. Children's questions are not always verbalized in advance; sometimes exploration precedes explanation, and explanation itself generates further exploration (Legare, 2014). Preschool children also conduct spontaneous experiments, altering conditions in order to see what happens (Cook et al., 2011), while adult instruction can both support and narrow the scope of such exploration (Bonawitz et al., 2011). From this literature, I take seriously the idea that inquiry is already present in preschool life, but I extend the argument by asking how inquiry is sustained through relational, material, and affective conditions rather than through cognition alone.

On this basis, I define emergent scientific inquiry as a relational process in which a child's attention

is drawn by an event, unsettled by a difference, sustained through social and material mediation, and carried forward through repetition, comparison, modification, and retelling. In this article, I use four analytical terms as a sensitizing vocabulary: event, response, mediation, and reflection. An event is a moment that gathers attention and makes something newly noticeable. A response is the way another person - or the child's own renewed action - meets that event. Mediation refers to the materials, spatial arrangements, tools, texts, and roles that help the inquiry continue. Reflection appears not only in explicit explanation but also in repeated trying, juxtaposition, narrative restatement, and redesigned action.

Wonder, in this framework, is not a decorative emotion added to inquiry after the fact, nor is it developed here as a full theory of wonder. It names the destabilizing quality of events in which the world no longer appears fully settled: a color behaves unexpectedly; a beam of light reveals a hand differently than expected; a child's remark about nose hair turns into careful observation of the body; color water intended for mixing becomes a medium for handprints. Wonder is thus a way of attending to relational unsettlement: the world presses back, and inquiry begins

Methodology

This study is an interpretive qualitative study based on active participant observation in a licensed nursery school in Saitama, Japan. Rather than treating the researcher as a detached observer, the study follows episodes from within the field of practice, attending to how meaning emerged through interactions among children, adults, materials, and the environment. The school serves mixed-age groups of three-, four-, and five-year-old children and is organized around everyday play, flexible movement across spaces, and a strong emphasis on responsiveness to children's interests. Across the two main phases of fieldwork, enrollment in the focal mixed-age group was approximately sixty-seven children in 2024 and seventy in 2025. The aim was not to compare individual children or establish developmental rankings, but to follow dense episodes in which inquiry visibly emerged through action, interaction, and material engagement. Methodologically, the study draws on participant-observation and child-ethnography approaches in which the researcher is situated within a concrete field and moves recursively among descriptive, focused, and selective observation as the inquiry is refined (Minoura, 1999; Shibayama, 2006).

The fieldwork developed across two phases totaling ten participatory sessions. In the first phase (June-August 2024), I entered the room in a role that, retrospectively, I came to call the "apron uncle." This phrase does not simply describe clothing. It names a relational position in which I was close to practice, trying to organize and support activities, yet often slipping into a teacherly desire to manage the scene, extract language, or make the activity "count" as science. I found myself asking children to name colors, distributing scarce materials, worrying about mess, and trying to stabilize the activity before I had understood the lines of attention children were following.

The transition to the "science uncle" emerged from this methodological and personal difficulty. After the first phase, I felt that the managerial position of the apron uncle made it difficult to stay close to children's own inquiries. In trying to act like a caregiver, I often found myself managing materials and order without fully inhabiting that role. Before entering the nursery-school field, however, I had worked as a science teacher; science was connected to my own interests, experience, and sense of identity. I therefore began appearing in a white lab coat and

glasses in the second phase (July-September 2025), not as a preplanned experimental manipulation, but as a way of reconnecting my own background with children's play and changing my stance in the field. The clothing functioned as a relational switch: it helped me approach children less as a manager of materials or caregiver-like figure and more as a co-inquirer who could ask, "What are you noticing?" or "What shall we try?" At the same time, it also changed how children approached me, the materials, and the activity.

Children did not merely receive this identity; they helped produce it. Some associated the white coat with scientists, doctors, medicine, dangerous substances, experiments, or research. Others called me "science uncle" and began bringing books, insects, bodily questions, handmade objects, and remembered experiments to me. In this sense, the role was not simply adopted by the researcher but co-produced in the meshwork of clothing, prior cultural images of science, children's responses, and repeated encounters. The shift became analytically meaningful because it changed the relationship through which children approached me, the materials, and the activity.

My positionality mattered throughout. I was not an outside observer entering an unfamiliar classroom. I was also deeply connected to the school through its founding and administration. That familiarity made fine-grained access possible, but it also made neutrality impossible. I therefore treat positionality not as a bias to eliminate but as an analytic condition to make visible. The transition from “apron uncle” to “science uncle” marked changes in how I was seen, how I approached children, and how readily inquiry moved from a brief event into a more sustained line of action.

The primary data consisted of fieldnotes, brief audio and photographic records, and short fragments of dialogue recorded during or immediately after participation. The fieldnotes were not treated as transparent reproductions of reality. They were reconstructions of lived encounters, written with attention to gesture, pace, repetition, movement, bodily orientation, children's calls to one another, and my own moments of hesitation, over-direction, surprise, and revision. In making interpretive claims about children's inquiry, I distinguish as far as possible between observed action or speech and my interpretation of what such action made visible.

Episodes were selected when they showed dense circulations among event, response, mediation, and reflection, especially in relation to the four research questions of the larger study. Analysis proceeded iteratively. I first identified episodes that repeatedly drew children back into action or conversation: re-making a color, staring at sediment, turning color water into handprints, talking about scissors, asking what science is, shining light through the skin, dissolving slime, or noticing color movement in chromatography-like play. Each selected episode was treated as an event unit and reconstructed by bringing together speech, gesture, gaze, bodily orientation, and the handling of materials. Through repeated re-reading, provisional analytic categories emerged, including surprise, invitation, repetition or retry, mediation, and opening or closing adult response. These categories were compared across episodes and then organized under the four research-question lenses: adult-child relations, question formation, observation, and experimental action. The episodes were subsequently re-read through event, response, mediation, and reflection. Fieldnotes, photographs, audio fragments, and the researcher's contemporaneous reflections were cross-checked so that the path from observed action to interpretation remained traceable. The movement among descriptive, focused, and selective observation was recursive rather than linear; later comparisons sometimes

prompted the re-description of earlier episodes and refinement of the provisional categories. Ethical approval for the broader study was obtained from the relevant institutional review boards and identifying details of the site and participants have been omitted or minimized for peer review.

Findings

Inquiry often began before explicit questions.

In the first phase, I sometimes assumed that inquiry would start once children could answer my prompts. For instance, I invited children to "name" the colors they were making, hoping to draw out language that I could interpret as scientific attention. The prompt mostly failed. Children were busy pouring, stirring, watching, and comparing. Yet one girl returned with a second cup and said, in effect, "I made the same color again." The event was not my verbal prompt. The event was her attraction to a color she wanted to recreate. Reflection appeared not as explanation but as repetition with variation. Only afterward did I realize that her action embodied a rudimentary concern with reproducibility.

A similar dynamic appeared when color water drifted into handprint-making. At the time, part of me read this as deviation: the activity was supposed to be about color water, not about painting hands and stamping paper. The fieldnotes show children putting color water on their hands and pressing handprints onto paper. Some returned to the action, while others gathered around and tried similar ways of using the liquid on skin and paper. Rather than assuming directly what the children were thinking, I interpret this shift as attention to how color could be spread, transferred, and left as a trace. The event was a material deviation. The response could have been a correction - "No, that is not what we are doing" - but when the action was allowed to continue, new lines of inquiry opened. This was one of the earliest moments in which I began to see that children's inquiries do not always honor adult boundaries between "the activity itself" and what counts as an extension.

In the second phase, inquiry sometimes emerged through humor or apparent impropriety. During one exchange, a child looked closely at my face and became interested in my nose hair. Rather than treating the remark as mere teasing or stopping the exchange, I responded by asking, "Why do we have nose hair?" I also told the children that, if they were going to observe, they needed to do so gently and carefully. This response reconfigured the moment. Children leaned in to look more closely, began asking about nose hair and nosebleeds, and eventually brought reference books about the body. What could have remained a teasing comment became a bridge into careful bodily observation, questions about blood, and collective comparison. Here inquiry began not with a carefully framed academic question but with a bodily detail that became newly visible and discussable.

Adult responses opened and closed inquiry.

Across the fieldwork, I became increasingly aware that the adult's role was less to supply questions than to choose whether a moment would be narrowed, redirected, or opened. In the first phase, my own responses were often too quick, too managerial, or too concerned with producing recognizable evidence of science. I wanted children to say the right kind of thing. I wanted to stabilize the scene. When many children crowded around limited materials, I moved into a mode of distribution, instruction, and control. The result was not that inquiry disappeared entirely, but that I often lost contact with the lines of attention children themselves were pursuing.

By contrast, in the second phase some of the most generative moments came from short, open, and lightly held responses: "How did you make that?"

"What do you think will happen?" "Shall we look from below?" "Let's try it." The difference was subtle but decisive. A child looking into a cup noticed pigment gathering at the bottom after repeated mixing. When I suggested looking from below through the transparent cup, the observation deepened. The child described the colors as separated and pointed to the muddy thickness at the bottom. I did not explain sedimentation. I offered a shift in vantage point. The response opened the child's own observation.

The same pattern appeared in a light episode. A child asked why light shines. Another child then claimed that when light is shone through the skin, the hand turns red. We tested this immediately with a phone light. Children held out their hands and observed the redness that appeared under the light. As a former science teacher, I immediately found myself thinking of topics I had once taught to sixth-grade pupils: the colors of the spectrum, wavelength, red light, sunset, and the familiar Japanese sequence of rainbow colors. These explanations were available to me. Yet if I had answered the original question by explaining electricity, light production, or wavelength, the inquiry would likely have moved quickly into a different register. Instead, I tried to keep the response close to the event. The question was met with a short invitation to look, test, and see. In that interval, the inquiry stayed alive.

This does not mean adults should never guide, name, or explain. Rather, the timing and form of adult response matter. A closing response rushes toward correction, predetermined meaning, or efficient completion. An opening response preserves enough uncertainty for the event to continue working on the child. In practice, this often meant waiting a few seconds longer than felt comfortable, refraining from translating everything into school language, and recognizing that children frequently need room to compare, imitate, retell, or modify before an explicit question becomes speakable.

Materials and environments acted as co-participants.

Children's inquiry was inseparable from the affordances of the materials and the configuration of the environment. Transparent cups, paper filters, paper towels, glue-like paint, the viscosity of slime, the brightness of a phone light, the edge of a cup filled to the brim, and even a video camera all participated in what could be noticed and pursued. These materials did not merely support already-formed questions; they actively redirected inquiry by altering what became visible, graspable, stable, or comparable.

One recurring example involved children filling cups almost to overflow. In an earlier phase, I experienced this largely as risk or mess. Later I began to see that the full cup created its own event: the bulging surface, the hesitation before spilling, the trembling line of water at the rim. Children watched for the threshold. They were not only making color; they were exploring limit, balance, and what happens at the edge of containment. Likewise, when children noticed paint accumulating at the bottom of a cup or spreading in thread-like patterns before mixing, the transparent container made a fleeting structure visible. The material setup created the possibility of attention.

Another strong example came when children stopped using paint water only for making color and began using it as an adhesive to stabilize stacked paper cups. Earlier in the project, I would likely have treated this as misuse. Instead, the episode revealed a material re-description: paint was no longer only "for painting" but also something sticky, connective, and experimentally useful. The event was the collapse-prone cup structure; the response was to test paint as glue; the mediation was the viscosity of the material

itself; and reflection appeared as repeated adjustment. In this sense, "paint becomes glue" names more than a clever deviation. It shows how inquiry can arise when children repurpose materials according to what the situation affords rather than according to adult categories (Harel & Papert, 1991).

The slime sessions showed the same principle. When borax was introduced slowly, children saw small clumps forming around the stick and named them jelly-like or strange. When a child proposed adding more with a larger spoon, the material changed rapidly enough that "It's slime!" became an exclamation of discovery. After touching the finished slime, another child asked what would happen if it were put back into water. That question emerged directly from the material encounter. We tested it together, and the dissolving slime was then compared to color water from an earlier day. Here mediation was not secondary. The material transformation itself generated the next question and allowed a bridge across separate sessions.

The chromatography-like activities made material mediation even more explicit. Coffee filters and paper towels were introduced side by side. Children handled them, compared their textures, and asked whether both would "work." When marker ink climbed through a wetted filter and separated into different bands or shades, some children explained it by saying it had dissolved, while others wondered whether the colors had already been mixed. These responses showed that children were not merely watching a demonstration; they were trying to account for the visible movement and separation of color through familiar ideas such as dissolving, mixing, and spreading. In this sense, the paper, water, ink, and container did not simply support the activity. They shaped what could be noticed, questioned, and compared.

Reflection appeared as repetition, comparison, retelling, and redesign.

Formal verbal explanation was only one mode of reflection, and often not the first or most important one. Reflection could be seen when a child tried to make the same color again, when children compared one another's mixtures, when a result was shown to me or to peers with pride, when children voted on which color to add next, when a cleanup moment turned into another mixing opportunity at the sink, or when a child asked me to come back next time with a different material to try.

Peer teaching offered a particularly clear case. When a child admired another's color and asked, "How do you make that?" The answer did not settle the matter. Instead, the explanation became part of a new experiment. Children imitated, adjusted, failed to match the color exactly, tried again, and in doing so learned that a procedure can be shared while a result still changes. Reflection here was distributed across voices, gestures, and repeated attempts. Similarly, during cleanup children often remained attentive to color change, dilution, residue, or new mixtures in the wash water. The end of the activity was not separate from inquiry; it was another phase of it.

In several episodes, reflection also appeared as return. Children remembered previous sessions and called for their continuation: "Did you bring color-water today?" "Let's do slime again." "Research today's why and come back." These returns mattered because they showed that inquiry had not been exhausted in the original moment. The event had left a line behind, and that line could be picked up later. From a holistic perspective, reflection was not simply inward thought after action. It was the re-weaving of experience across time, materials, relationships, and renewed acts of attention.

Discussion

The findings suggest that early scientific inquiry is best understood not as a miniature version of school science but as a relational process that may, under some conditions, later connect fruitfully to more formal scientific procedures. This does not require us to abandon careful observation, comparison, or explanation. It requires us to notice that in early childhood these processes often begin in forms that are materially entangled, affectively charged, and socially distributed. A child may arrive at something like reproducibility by trying to make a beloved color again. Another may arrive at experimental comparison by wondering what happens when slime re-enters water. Another may arrive at observational rigor by changing the angle from which a cup is viewed.

The analytic sequence of event, response, mediation, and reflection clarifies why some lines of inquiry thicken while others collapse. An event alone is not enough. A striking occurrence may disappear unless it is met by a response that leaves room for continuation. Nor is adult openness alone enough. Without materials that can hold traces, afford comparison, or invite redesign, inquiry remains thin. Reflection, finally, is not an afterthought. It is the re-composition through which children carry something forward: a repeated act, a comparison, a story, a request to revisit, or a new configuration of materials.

For holistic education, this matters in at least three ways. First, it challenges narrow separations among cognition, body, relationship, and imagination. The episodes in this study show that humor, beauty, mess, bodily curiosity, and material resistance are not distractions from learning; they are part of how learning becomes possible. Second, it suggests a different image of the adult. The adult is not primarily the supplier of questions or the corrector of misconceptions. The adult is a mediator who protects the vitality of the event long enough for inquiry to gather shape. Third, it implies that educational environments should be designed not only for efficiency or safety, but also for visibility, revisitation, and reconfiguration. Transparency, movable materials, accessible tools, books nearby, and enough temporal slack for repetition all matter.

This argument also has implications for the relation between preschool and school science. If preschool inquiry is judged only by the criteria of institutional science, much of its significance disappears. Yet if preschool inquiry is romanticized as pure spontaneity, opportunities for deeper noticing and comparison may also be lost. The more useful task is to understand the translation between them. What forms of adult response help a child move from attraction to comparison? What material arrangements help a fleeting event become revisit-able? How might school science inherit from preschool not only curiosity, but also attentiveness to event, relation, and material variation? These are curricular as well as philosophical questions.

The study also changed my own view of young learners. I entered the field expecting inquiry to become visible when children articulated questions or followed procedures resembling school science. Through the fieldwork, I came to see young children not as pre-scientific learners waiting to acquire formal methods, but as already active investigators whose inquiries may first appear in bodily repetition, humor, material repurposing, and relational calls to others. What surprised me most was that events I initially read as mess, misuse, or teasing - spilled color water, paint used as glue, or a child's comment about nose hair - could become the very conditions through which observation and experimentation emerged. This surprise does not reject the theoretical model of event, response, mediation, and reflection; rather, it reminds me that events often announce themselves through forms adults are trained to dismiss.

The study has clear limitations. It is based on one site, one deeply involved researcher, and a limited number of selected episodes rather than a comprehensive account of all classroom activity. Because I was embedded in the life of the school, the findings are inseparable from my own responses, mistakes, and shifts in stance. This is not a weakness to be erased, but it does mean that the article offers a relationally situated interpretation rather than a universal model. Future work could refine the vocabulary of opening and closing responses, compare similar cycles across settings, and examine how documentation practices might make emergent inquiry more visible to teachers without flattening it into checklist pedagogy. It could also examine more closely how humor, bodily sensation, and material misuse become legitimate beginnings of scientific inquiry in early childhood settings.

Conclusion

This article has argued that young children's scientific inquiry often begins in moments that formal educational language easily overlooks: an unexpected color, a joke, a spill, a sticky substance, a body part, a remembered experiment, a material that suddenly behaves differently. When such moments are met with responses that preserve uncertainty, supported by materials that make differences perceptible, and carried forward through repetition and retelling, inquiry becomes visible as a holistic process of meaning-making. Inquiry does not wait for mature language. It begins in attention, relation, and embodied experimentation.

To describe this process as holistic is not to make it vague. It is to insist that children's inquiries are woven from sensation, movement, speech, memory, social recognition, and material affordance. To describe it as scientific is not to force it into a premature school-science mold. It is to recognize in children's actions an already active commitment to noticing, testing, comparing, and revising in relation to the world. If educators can learn to inhabit this space as co-inquirers and careful mediators, then the nursery school becomes not a prelude to inquiry, but one of its fullest and most revealing forms.

The most important pedagogical implication is therefore also a change in adult stance. Educators need not choose between leaving children alone and directing them toward predetermined outcomes. They can learn to wait with an event, ask lightly, offer materials, protect safety without over-controlling meaning, and allow children's repetitions and re-designs to show what is becoming significant. In this sense, early scientific inquiry is not only something children do; it is a relationship adults learn to recognize, sustain, and join.

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