

CHAPTER XVII

Designing the Environment

“The art of progress is to preserve order amid change and to preserve change amid order.”

Alfred North Whitehead, *Process and Reality*

• The Ant Trail, Again

Chapter 1 opened on a four-year-old crouched over an ant trail on the sidewalk, eleven minutes in, moving a twig to see what the ants would do. Then an adult tapped her on the shoulder and called her inside for the science lesson.¹

Run the scene again. Call her Rosie. This time her mother sees her from the porch and doesn't call her in. She walks over, crouches down beside her, and waits. After a while Rosie says, “They go around it now.” Her mother says, “I wonder where they're going.” Rosie looks up, and then follows the trail with her eyes to the crack under the kitchen step.

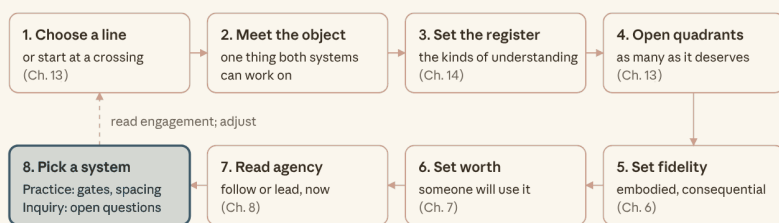
There are ants in the kitchen this week. Nobody has found where they're getting in.

This chapter turns the model into a method a family runs day to day, with the team Chapters 15 and 16 describe: people who carry care and craft, and a supernatural tutor that holds the learner model.² It walks a single worked path, from a developmental line to a learning object, through each of the book's lenses and dials, to a choice between Inquiry and Practice. It returns to Rosie's whole season as a curriculum column, with each system tied to concrete objectives. It settles the delivery question in the terms of Chapter 16: what the tutor carries, what the present adult carries, and what the family decides. And it ends where the book began, with the one measure that governs the whole model.

🐜 The Worked Path

Every chapter of the book handed you a lens or a dial. Here they are in the order you'd use them to plan, with Rosie's ants carried through each.

One worked path, from a line to a system, steered by engagement



The order is a checklist for planning. In the room, the steps run in whatever order the child's engagement asks for.

Figure 17.1 · the worked path (schematic)

The path runs from a line to a system, and engagement read at the end sends you back to adjust any step.

1. Choose a Line, or Start at a Crossing

You can begin with a line on the child's psychograph, one that lags or one that's pulling, and travel it until you meet an object. Or you can begin where

several lines cross, at an object rich enough to ask something of many of them at once.³ Rosie's psychograph this season shows the naturalistic line pulling hard: she collects pill bugs, names the birds at the feeder, and asks about every dead beetle on the porch. Her will line is young. She drops a task the moment it gets boring.

2. Meet a Learning Object

The object is the thing both systems can work on: one referent, one context, close together in time.⁴ For Rosie it's the ant trail, and the ants in the kitchen. It's a rich object. It asks for close looking (naturalistic), counting and comparing (cognitive), lying still on her stomach on the walk (physical), waiting while nothing seems to happen (will), and not stepping on them (moral).

3. Set the Register

Run the object through Egan's kinds of understanding and ask which tools the child holds in this domain.⁵ At four, Rosie's are somatic and mythic: the body, story, stark opposites, mystery. So the ants don't arrive as taxonomy. They arrive as a story: the scouts who go out with nothing and come home loaded, the long road home, the one ant who got lost. The opposites are the carriers and the empty-handed. The mystery is where the road ends.

4. Decide How Many Quadrants the Object Deserves

The ants deserve two this season.⁶ The outer individual (what can you see them do?) and the inner individual (how would it feel to carry a crumb bigger than your head?). The collective quadrants reach her through story, as a colony that works like a village. Who the ants are to the people next door who put out poison is a question for a later return, when she's eight.

5. Set Fidelity

Choose how embodied and how consequential the encounter will be.⁷ Real ants, real crumbs, a magnifying glass, and a body on the sidewalk. The world

answers back: lay down a crumb and see whether the trail bends toward it. A video of ants would be easier and would teach her less.

6. *Set Worth*

Connect the output to someone who will use it.⁸ The ants in the kitchen are a real problem, and nobody has found the way in. Rosie becomes the family's ant detective. When she finds the crack under the step, her father seals it that evening, and she watches him do it. Her finding gets used.

7. *Read Agency in the Moment*

Who is steering right now?⁹ At the trail, Rosie pulls, so her mother follows and asks. Twenty minutes in, Rosie drifts toward the swing, and the pull is gone. Her mother leads, briefly: "Let's count how many go by while I count to ten." If that lands, they keep going. If it doesn't, the swing wins, and the ants will be there tomorrow.

8. *Choose Inquiry or Practice*

The two systems can run at once, and on a good afternoon they trade places every few minutes.

On the **Inquiry** side, the adult keeps the questions open. Where do you think they're going? Why do they go around the twig now? What would happen if it rained? She doesn't answer them. Rosie's guesses get tested by the ants.

On the **Practice** side, the mechanisms of Chapter 12 take the forms of Chapter 14.¹⁰ Counting is the skill: ten ants past the twig, ten crumbs laid in a row, one to one. The gate is physical and self-evident: she counts ten crumbs into her father's hand without a miss, on three different days. The schedule is the rhythm of the day: the walk past the trail every morning, the crumbs at the end of every lunch.¹¹

A Four-Year-Old's Curriculum Column

One object is a morning. A season is many objects, chosen so that every line gets something to do. Laid out as a column, Rosie's autumn looks like this. Each row ties both systems to something concrete she'll be able to do or ask, with the gate and the schedule in the form a four-year-old's day can carry.

LINE	OBJECT	INQUIRY: THE QUESTION KEPT OPEN	PRACTICE: THE OBJECTIVE, GATE, AND SCHEDULE
Naturalistic	The ant trail; the bird feeder	Where do the ants go? Which bird comes first in the morning?	Names five birds at the feeder. Gate: names them unprompted on three mornings. Schedule: breakfast at the window.
Cognitive	Setting the table	When a guest comes, how many more forks?	Counts to ten, one to one. Gate: sets the table for five without a miss, three evenings running. Schedule: every dinner.
Physical	The playground ladder; pouring water	How high can I go? Why does the pitcher spill when it's full?	Climbs the ladder unaided; pours a cup without spilling. Gate: the pour, three days in a row. Schedule: the afternoon park, the dinner water glasses.
Will	Bread that has to rise	Why do we have to wait?	Waits for the rise without opening the bowl. Gate: one full rise without peeking. Schedule: Saturday baking.
Musical	Clapping songs; the drum	Why does that song make me want to march?	Keeps a steady beat on the drum for one verse. Gate: holds it through a song with Grandpa. Schedule: songs at bath time.
Interpersonal	Taking turns with her cousin	Why did Leo get sad?	Waits her turn in a two-person game. Gate: a whole game without grabbing. Schedule: Thursday visits.
Moral	Cutting fair slices	Is it fair if I get the big one?	Divides a snack fairly between two. Gate: the family agrees it's fair. Schedule: every afternoon snack.
Aesthetic	Painting the garden	Tell me about your sky.	Mixes two colors to get a third. Gate: makes green on purpose. Schedule: the easel stays out.

The column is a plan, and engagement can rewrite it any morning. If Rosie spends a week on beetles and none on the drum, the drum waits. The column's job is to make sure no line goes a whole season without being asked anything.

Who Does What

Chapter 16 drew the division. Here it is as a family runs it.

WHO	WHAT THEY CARRY	IN ROSIE'S WEEK
The supernatural tutor	The grid; the learner's knowledge and behavior graphs; the Practice and its schedule; the briefings for the adults	Lays out the ant trail's grid on Sunday night, tracks the counting gate, and sends her mother a short note each morning
A present adult	Presence, stakes, and the relationship	Her mother at the trail; her father sealing the crack; Grandpa singing on the video call
The family	What the child will actually do, decided in a weekly review	Twenty minutes on Sunday evening

Mediated Mode

For young children the tutor works in **mediated mode**: it prepares and advises, and a parent does the talking.¹² Rosie never hears its voice. Her attachment stays with the people who crouch down beside her. What her mother sees on Tuesday morning is something like this:

Rosie counted to seven at the trail yesterday before she lost her place. Try counting with her on her fingers today, and let her lay a crumb for each ant. She asked twice where the ants sleep. You might ask her where she thinks, and leave it open. The kitchen ants came in again near the back step this morning.

The note is short, specific, and written to an adult. The age at which a child starts talking to the tutor directly is the family's call. Chapter 16 leaves it as an open question, and so does this chapter.

The Weekly Review

Once a week, the family sits down for twenty minutes. The tutor brings the record: what happened, where engagement ran high and where it dropped, which questions Rosie carried, which gates she passed, which line hasn't been touched. It proposes a handful of objects for the week. The family chooses, drops, and adds, because the family knows things the record doesn't: Grandma is visiting, the car is in the shop, Rosie has been clingy since the new baby came. The tutor proposes. The family decides.

As the child grows, she joins the review. At four her pulls shape the plan. By middle childhood she proposes objects of her own. By adolescence she sets the goals with her parents.

Where the Real Things Come From

Fidelity and worth both need the world, and a tutor on a screen can't supply it. The family has to know where to look. Most of it is closer than you'd think.

The household. The kitchen, the garden, the toolbox, the laundry, the budget. A household runs on real work with real consequences, and nearly all of it can be shared with a child at some size: the table set for five, the hem on a brother's trousers, the bill read line by line.

The neighborhood. The neighbor who forecast weather for thirty years. The baker who'll show a seven-year-old the proofing room. The hardware store, the library, the creek behind the school. A tutor that knows the child's questions can route them to the person on the street best placed to answer.

Elders. Grandparents and older friends carry what no record holds: the night of the storm, the farm before the highway, the trade they practiced for forty years. Their stories open the collective quadrants, and their attention is care with stakes.

The family's own work. Whatever the parents do for a living or for love, a child can see some part of it done well. Craft is caught by watching someone who enjoys it.

People who need something. The eighty-year-old next door who needs a hurricane kit. The food bank that needs sorting. The younger cousin who needs reading to. Work that someone uses is worth, and it's rarely hard to find once you start looking for who is waiting on a result.

The living world. Ants, weather, the night sky, the tide. It answers back to everyone, and it costs nothing.

Families without a forecaster next door can pool. A few households, each with an adult strong in a different line, can trade afternoons, and the tutor can carry the plans and the record between them. Finding and vetting people outside the household is real work. A family should treat it with the same care it would give to choosing a babysitter.

📖 Reading Care in the Tutors

Care in a tutor, human or machine, has three parts: knowing the child, wanting the child's good, and staying.¹³ None of the three can be assigned. All three can be read, and a family should read them in every member of its team.

PART OF CARE	WHAT TO LOOK FOR	THE WARNING SIGN
Knowing the child	Accurate references to the child's history, questions, and people. "She's been asking about where the ants sleep since Tuesday."	Generic praise; advice that would fit any child; a tutor surprised by something the child has said ten times
Wanting the child's good	Regard that holds steady whatever the results. Drivers faded as the work takes hold. The child sent toward other people and activities, beyond the tutor itself.	Warmth that rises and falls with performance; flattery; a tutor that keeps the child coming back to itself
Staying	Sessions kept. Notice given before a change. Years of tenure where the family wants them.	Missed sessions; a rotating cast; a relationship that resets every few months

Craft gets read alongside care: does this person, or this tool, know the domain and visibly enjoy it, and does the child's skill grow with them? When care or craft is missing, the family changes the tutor. The child keeps her own pace.

The tutor's knowing is checkable in a way a person's isn't. A family can ask it what it thinks Rosie understands about counting, and then watch Rosie count. Where the model and the child disagree, the child is right, and the model needs fixing.

• The Single Measure

The whole model answers to one measure: **cognitive engagement**, the mind at work on the object, tracked across both systems.¹⁴ Read it in Inquiry and in Practice. Compare the two. When they rise together, the systems are feeding each other. When one climbs as the other falls, one is crowding out the other, and you know where to adjust.

And judge it by what the child does after the tutor leaves. Does Rosie go back to the ant trail the next morning, unasked? Does she still count to ten, one to one, a month after the gate? Which questions does she carry, and to whom does she bring them? Time on a device counts for nothing here. A model that kept her eyes on a screen would score zero by this measure, however long she stayed.

Everything else in the book is a way of raising that measure, or of reading it better: the drivers, the dials, the lenses, the mechanisms, the team.

• Principles for Any System That Watches a Child

A tutor team that observes a childhood produces the most intimate record a family will ever hold. Four principles govern any system that does it.

The family owns the data. The learner model belongs to the child and the family. No company, school, or state holds it, sells it, or reads it without the family's leave. It is a map for choosing what to offer next, and it is never a report on the child.

Capture is limited to what serves the child's learning. More knowing never justifies more watching. The model grows by watching the child live. It

never grows by examining her, testing her to fill in its gaps, or recording what has nothing to do with what she's learning.

Consent grows with the child.¹⁵

STAGE	THE CHILD'S SHARE OF INTENT	THE CHILD'S SHARE OF CONSENT
Early childhood	Her pulls shape the plan	None; the family decides
Middle childhood	May propose objects and goals	May refuse any recording
Adolescence	Sets intent jointly with the family	Approves any sharing outside the family
Adulthood	Sets her own	Owens the record, including whether to keep it

Any AI that talks to a child says it is an AI, never performs attachment, and sends the child toward people and the world. It never claims feelings for the child or a need for the child. It never asks for secrets. Its best moves often end the session: go ask your grandmother, go look at the sky, go finish the shelf.

 Open Problems

The model is complete enough to run, and it leaves real problems unsolved. Four matter most.

Engagement proxies for young children. The whole design steers by engagement, and the reading is weakest where it matters most. A confused three-year-old squirms and looks away. So does a bored one, and so does one deep in thought about something else. The five proxies of Chapter 4 are working candidates.¹⁶ Moment-to-moment readings that hold up for the youngest learners still have to be built and tested.

Reading agency inside software. A parent at the ant trail can tell in a second whether Rosie is pulling or drifting. A system reading taps and pauses can't yet do that reliably, and agency is the reading that decides who steers.¹⁷ Until it can, the present adult reads agency, and the tutor defers.

Keeping an engagement objective honest. Any measure pursued hard enough gets gamed, and engagement is a valuable thing to game. The answer the book gives, judging the tutor by what the child does after it leaves, is the right one. Making that answer survive contact with a business model is still an open problem.

The depth of Fischer's theory. The book uses a fraction of dynamic skill theory: the web, functional and optimal levels, skills in context.¹⁸ Fischer and his successors built much more: the tiers and their transitions, the way skills join, the microdevelopment of a single afternoon. A great deal of it is still waiting to be turned into design.

The Ant Trail at Dusk

The light goes. Rosie's mother says it's time to come in, and Rosie says, "The ants are going home too." She's right. The trail has thinned to a few stragglers heading for the crack under the step, which her father sealed an hour ago. They find another way in. She'll notice tomorrow, and she'll want to know where.

Nothing in that afternoon needed a classroom, a test, or a sticker chart. It needed a child with a question, an adult who crouched down instead of calling her in, a real problem in the kitchen, and something, person or tool, keeping track of what she's learning across the whole of her life. The rest of this book is detail.

If you try it, I'd like to hear what your child carried in from the trail.

Notes

1. See Chapter 1, "The Ant Trail."
2. See Chapter 15, "Aristocratic Tutoring, Reimagined," and Chapter 16, "The Supernatural Tutor."
3. See Chapter 13, "The Lines: A Map of Humanness" and "Cross-Line Depth."

4. See Chapter 2, “The Same Learning Object.”
5. See Chapter 14, “Applying the Lens to a Learning Object.”
6. See Chapter 13, “Quadrant Depth.”
7. See Chapter 6, “Setting Fidelity.”
8. See Chapter 7, “Value Work, Busywork, and Make-Work.”
9. See Chapter 8, “Agency: Reading Who Steers.”
10. See Chapter 12.
11. See Chapter 14, “Worked Examples.”
12. See Chapter 16, “Risks: Zak Stein’s Warnings.”
13. See Chapter 15, “Care and Craft,” and Chapter 16, “Care, Expanded.”
14. See Chapter 4, “Where Engagement Leads,” and Chapter 9, “Working Tests.”
15. See the Technology Specification, section 14 (consent stages).
16. See Chapter 4, “Proxies for Engagement.”
17. See Chapter 8, “Agency: Reading Who Steers.”
18. See Chapter 13, “Why Each Line Must Be Raised on Purpose.”

Sources

SOURCE	USE
Alfred North Whitehead, <i>Process and Reality</i> (1929)	Epigraph
Kieran Egan, <i>The Educated Mind</i> (1997)	Setting the register
Ken Wilber, <i>Integral Psychology</i> (2000)	Lines and quadrants
Kurt Fischer and Thomas Bidell (2006), dynamic skill theory	The web; skills in context; the depth still to be mined
Nel Noddings, <i>Caring</i> (1984)	Care as knowing and wanting the other’s good
Zak Stein (2019–2026), on AI and children	Mediated mode; AI that sends the child toward people
<i>Inquiry and Practice</i> Technology Specification, vo.5	Consent stages; data ownership; limits on capture; rules for AI that talks to a child

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