Everything is designed, from the chair you’re sitting on to the app you use for exercise class to the policy for taking time off from your workplace. Not everything was designed well or even intentionally, but somewhere, someone(s) made a decision about everything people have put into the world. Their reasons for doing so—the gaps they aimed to fill—varied, but each item ends up as part of an interconnected system.

We’re now in an era where the things we make are altering our relationships with everything—each other, the natural world, and even ourselves—at an alarming rate. A strange time like this calls for some strange ways of thinking so you can reveal issues and opportunities before they come. Understanding the layers of design helps us to understand the how and why behind a product or thing; once we see the layers we can start to selectively unsee to reveal new ideas.

The following activities are based on concepts from Assembling Tomorrow by Carissa Carter and Scott Doorley, which explores why even the most well-intentioned innovations go haywire, and the surprising ways we can change course to create a more positive future. These activities are designed to help you look at things more intentionally to uncover effects and influences you otherwise might miss. It has been adapted for use in both high school and higher education classrooms.
Activity: The Layers of Design

To help learners of any age see the web of connections embedded in our lives.

WHERE TO USE THIS ACTIVITY

Classrooms | Workshops

MATERIALS

No materials needed

FORMAT

Individual work, with opportunity for paired or group reflection

INSTRUCTIONS

Map the Layers

Everything is designed in layers. Those layers, simplified, look like this: Data, Tech, Product, Experience, System, and Implication. It’s simplest to start with a product and from there you can see how the flow of its existence permeates every layer of design all at once.

Map the design layers of an everyday object. Select an everyday object, like a fork, a pencil, or a chair. This object is a product. Now, answer the following questions to explore the many layers of design involved with that product:

- What experiences come from using that product?
- What systems govern its use, or how it gets to you, or how you dispose of it?
- What technologies does it use? Are they analog, electronic, or something else?
- What data might have been used to design the product?
- What implications does using or producing the product have on people or the planet?
For example, take a Paper Mate Flair pen. It’s a physical product made up of other physical products. Someone designed the plastic housing, the metal clip, and the cap. Someone also designed the experience of writing with this pen, looking for the right balance of enough weight to make a mark but not too heavy to hold. Someone also designed the system that delivers these pens. They come in boxes of twelve, which may be bundled in a pack of twelve. The system is made for distribution. And when the pens run dry? You throw them out. Waste is part of the design. Despite the pen being a physical product, its design includes technology and data. All the mechanisms, from metal clip to cap closer to ink movement, are technologies. And the data is about us. Human ergonomics data powered this pen design. Every decision, and the form that follows, has implications. Left-handers smear. Those who are differently abled accommodate the pen. All of us make waste that contributes to environmental degradation. And, of course, pens allow us to write.

Map the design layers of something more complex. It’s possible to complete the same thought exercise using any layer of design as a starting point. For example, Earth is a giant system with many subsystems: the geosphere, biosphere, hydrosphere, atmosphere, and cryosphere. Each subsystem can be broken down into component parts: biomes, watersheds, continents, and on. Try to work your way through the layers. If you try to consider everything, your head will spin, but that dizziness is the complexity of interconnection.

**Lose the Object**

Once you have an understanding of the system a product was made within, you can start to alter your view to see it in new ways. Getting rid of objects is a trick that has practical uses. It brings often unseen factors like interactions and relationships into better focus.

Start small. Take an ordinary situation where someone or some people are doing something, then ignore the tools and the setting and just focus on their movements. For instance, watch a loved
one or roommate make a meal. Ignore the cabinets, stovetop, tools, and appliances and turn your attention toward the choreography of the kitchen. What is the sequence of events? How does the person's body move from here to there? Are they reaching or bending? Crossing from one side to the other? You'll find that the way you've set up the kitchen leads the dance of cooking. It may inspire you to reorganize your countertops and cabinets to create a smoother dance. Architects are aware that the spaces they design are recipes for these little dances.

Try a more complicated situation. This silly method works in serious situations too. It is an amazing way to reveal power dynamics. Subtract the tables, whiteboards, podiums, desks, food, and whatever else from any “official” gathering—like a meeting or a class—and it will bring human relationships into focus. Who's facing whom? Who's talking and who's not? What's everyone's posture? Who makes eye contact, who doesn't? Who has high status and who has low? Who moves and who doesn't? Does status ever seem to shift?

When you put this technique into a prickly context, the exercise strays from its whimsical roots. You might find it so profound that it makes you uncomfortable. Taken to an extreme, it can feel a bit like eavesdropping on someone else’s soul. That is the sheer power of sticking with what’s happening rather than letting it pass by. That’s deliberate disorientation.

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**WE’D LOVE YOUR FEEDBACK!**

*This educators’ guide is a prototype (hooray!)*. We're hoping to understand what types of materials are useful to educators and learners in K12 and higher education classrooms. If you used this, please share your feedback with us in this four-question survey.

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**WANT TO READ MORE?**

*Check out Assembling Tomorrow!* The book offers even more ways to understand the intangible forces of design and how we can innovate in smarter and kinder ways.

Learn about all of our d.school books at dschool.stanford.edu/books.

To request a complimentary examination copy to review for use in your classroom, contact Penguin Random House Education at k12education@penguinrandomhouse.com for PreK–12 Education or highereducation@penguinrandomhouse.com for Higher Education.