habitats for creativity

5 principles to design the ideal space

BY KELLY PARKINSON // HERO DESIGN LLC

Habitats for creativity are emerging in places people were not expecting to feel creative.

These spaces may serve different purposes—from the new hospital wing in an urban center, to the 7th floor lobby of a corporate headquarters in the suburbs, to the entrance of a rural library.

Yet, they were designed by teams who understood that creativity is a universal human requirement—one any space can be designed to meet.

Many design standards inspired by science and anthropology have become widely adopted—including color theory, symmetry, dimensional proportions, and even ADA. There is not yet a common standard to design for creativity, which is perceived as subjective and difficult to measure.

This white paper makes the case for designing for creativity, then presents a general framework for designing the ideal habitat.

Whether building a library or a residential community, those who incorporate tactile creativity into their spaces will find they have created the ideal space for learning and engagement.

This white paper compiles research in fields from anthropology to psychology to neuroscience to explore:

- Why creativity is trending in traditional industries like government, finance, education, and healthcare/science
- How to embed creativity into a physical space (so you overcome obstacles like adaptation)
- The universal creativity brain sequence, according to neuroscience
- Scaling creativity—how to expand individual creativity throughout the organization
- Making the case for creativity in a project

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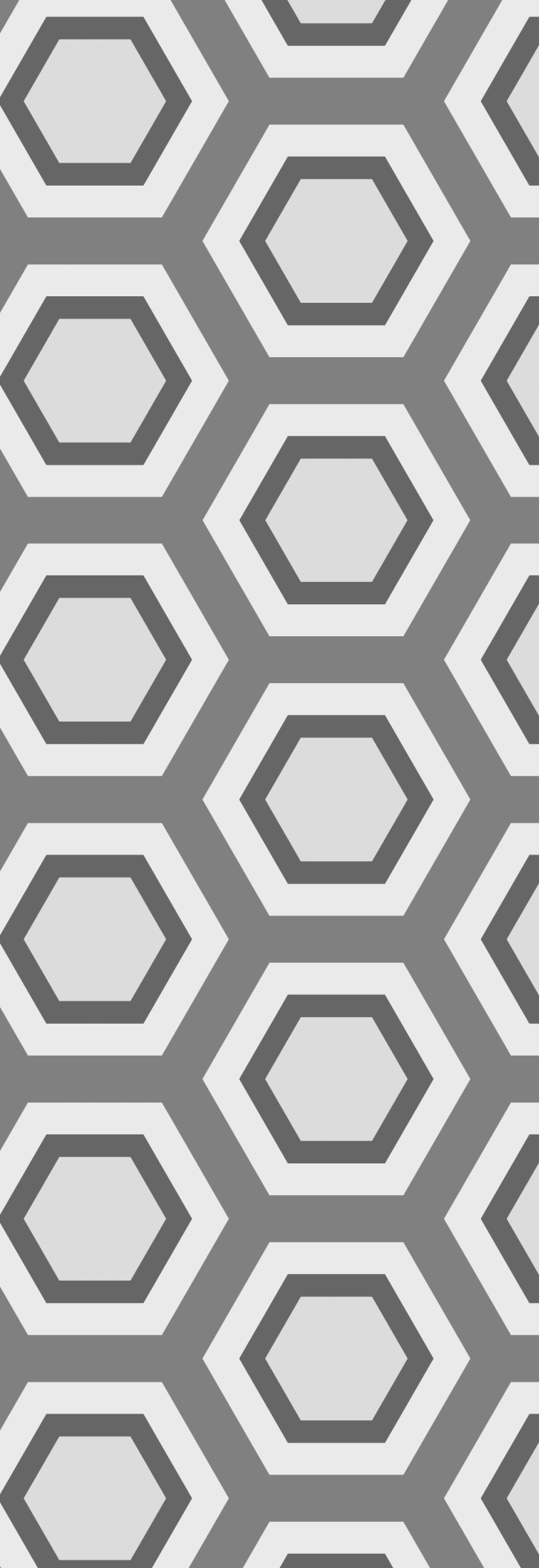


CHAPTER 1

INTRODUCTION

Creativity is human. An inseparable part of us, creativity is embedded into our neural structures.

As humans, we have a drive to create—even when it doesn't seem practical. Creativity is as fundamental to science as it is to art. The process that enables an artist to paint an impressionistic landscape is the same one that enables a team of researchers to bring a new drug to market. Creativity also happens to be the only human capability that can never be entirely automated or replaced by machines.

When creativity happens in a public space, it is no accident. It is a carefully orchestrated sequence designed to meet humans' universal needs. When a space is not designed for creativity, it is also not designed to induce measurable goals that everyone agrees are important—such as high performance and productivity; innovation through greater collaboration; learning retention; and reduced stress, pain, and anxiety.

Creativity is a fundamental human need that, when overlooked in the design of a new space, will cause problems from disengagement to overstimulation.

As technology becomes more sophisticated in its ability to interrupt us throughout the day, priming some brains for instant gratification, the time has come to prioritize and standardize on designing for creativity. Modern spaces have not been designed to counterbalance the effects of technology on human development.

Designing for creativity is not a trend destined to fall out of fashion when the mood changes. (See The Adoption Curve of Designing for Creativity). Research shows that just as we use our brains to change our physical environments, so our physical environments can change our brains—and our biology.

Other design standards and best practices have been widely adopted and even legislated. We have yet to develop a common standard for designing for creativity. Perhaps that is because creativity is widely perceived to be subjective and difficult to measure. But there are principles that, when followed, can produce consistent and predictable results, forming habitats of creativity.

A space that aligns with human creativity requirements can take many forms. This white paper presents scientific, anthropological, and psychological research to demonstrate the universal requirements for human creativity.

It also provides a framework for how a physical environment can be designed to meet these human requirements, and to result in higher creativity (and engagement).

What Is Creativity?

Pyschologist and author Mihaly Csikszentmihalyi calls the act of creating a "painful, risky, difficult" activity that "stretches the person's capacity" and "involves an element of novelty and discovery," resulting in "an almost automatic, effortless, yet highly focused state of consciousness." [1]

Csikszentmihalyi differentiates between two types of creativity—personal creativity, and creativity that impacts a culture or domain. Personal creativity, he writes, "refers to people who experience the world in novel and original ways. These are individuals whose perceptions are fresh, whose judgments are insightful, who may make important discoveries that only they know about." The second type of creativity, he writes, produces work that "changes a culture in some important respect."

An organization—whether a large company, a library, or a hospital—is concerned with producing both types of creativity. First, where all individuals feel valued, motivated, and capable; and second, where business results are produced through collaboration and innovation. There is no way to be certain which individuals will produce this year's groundbreaking insight or body of work. The key is to become the kind of place where such breakthroughs can occur.

As Csikszentmihalyi writes, "Creativity occurs when a person, using the symbols of a given domain such as music, engineering, business, or mathematics, has a new idea or sees a new pattern, and when this novelty is selected by the appropriate field for inclusion into the relevant domain. The next generation will encounter that novelty as part of the domain they are exposed to, and if they are creative, they in turn will change it further."

Why Creativity Is Hard (In Public)

Creativity makes rare public appearances. People are most likely to report feeling creative when they are in their cars, according to one study. Consider the advantage of a private vehicle over a space shared with hundreds of others.

Cars can:

- Immerse us in a novel, sensory experience whose climate and choice of music we can tailor to our minute-by-minute preferences
- Provide us with a tactile opportunity to move our hands, so our minds can engage in unfocused, meditative reflection
- Constrain our options with clear, rules-based templates, while still allowing for spontaneous improvisation

A car would be an ideal habitat for creativity if people were able to write, collaborate, hold meetings, and drive at the same time.

Public spaces do not typically allow this kind of individual flexibility and personalization. Waiting in queues, wrangling group members, and looking for the departure gate are more likely to induce panic than creativity. A workplace likewise faces its own obstacles—from time and resource constraints to physical constraints to unclear expectations.

Three additional factors inhibit creativity in modern public spaces:

1) Technology and our modern bias for calculative thinking—actions and thoughts that produce measurable results

2) Fear of judgment

3) Homogeny and standardization as spaces must meet diverse needs

1. Technology and Our Bias for Practical Thinking

Business people and educators have long placed a premium on all that is measurable—from domain knowledge to technical skills. If creativity cannot be measured, then it cannot be real. And if it isn't real, then how can it be worth the time?

Innovation and design have emerged as the measurable and therefore valuable forms of creativity, while traditional arts programs like painting, sculpture, and music receive less and less funding each year.

Meanwhile, technologies from touchscreens to smartphones to wearables are creating entirely new patterns of human behavior.

As humans merge with our machines, we are restructuring our hardwiring.

Scientist Edward O. Wilson refers to this process as "gene-culture coevolution," which he calls "a complicated, fascinating interaction in which culture is generated and shaped by biological imperatives while biological traits are simultaneously altered by genetic evolution in response to cultural innovation."

Henry Francis Mallgrave writes, "The key to this gene/ culture reciprocity is certain 'epigenetic rules' (changes caused by mechanisms other than changes to the DNA sequence) that 'direct the assembly of the mind,' and culture thereby becomes 'the translation of the epigenetic rules into mass patterns of mental activity and behavior." [2]

Technology is structuring our days—and our brains—so that we are becoming conditioned to look to screens and devices to provide instant feedback and communication, de-prioritizing any activity that does not provide feedback or lead to a measurable outcome. Mallgrave writes that our own neural plasticity makes us "more susceptible to the influences of technologies and culture than we formerly believed," and that "plasticity can work both ways. It can enhance or delimit our perceptual or cognitive processes, and at a much faster pace than genetic theory allows." [3]

When every task is calculated to produce a rapid result, it is easy to forget why any of these tasks matter.

Mallgrave cites artist Warren Neich, who refers to the process of sculpting the brain as "visual and cognitive ergonomics," explaining that "when neural networks are activated over and over again by similar stimuli they form 'amplified maps' for these stimuli, which not only operate faster and more efficiently but also acquire a neurological advantage over other networks." [4]

Professor and writer Diane J. Bowser puts a sharper point on it, arguing that our technologies have engaged us in a "game of trivial pursuits where we do nothing but interact for the sake of communication itself." [5]

Coupled with this monopoly of measurability is a technology-driven reliance on one human sense—vision—above all others. New spaces and buildings are designed to appeal primarily to the human sense of vision by inspiring feelings of calm and well-being.

Although awareness of the body-mind connection and differences in work styles have led many organizations to embrace sensory features like standing desks and introvert phone booths, these serve a measurable organizational purpose such as higher productivity and employee engagement.

Tactile, creative play—which engages all of the senses and activates the part of the mind responsible for high-level executive decisions—is not typically sought after, because it is not perceived to be linked to measurable outcomes.

2. Creativity In a Public Space Feels Risky

Whether it's fear of judgment or fear of being interrupted, simply being in a public space adds a highly risky and

unpleasant element to creativity. Most people do not want to paint on giant canvases in public.

We can't all be accomplished artists. The fear of judgment is imminent, not to mention the mess.

When given a choice between delivering an impromptu toast at a wedding reception, and giving directions, many people would prefer the latter. The conditions for an idyllic, secluded creative environment, free of social shame and interruptions, would be very difficult to replicate in a public space.

3. Public Spaces Are Designed for Groups, Not Individuals

All organizations want to attract highly-motivated individuals. Humans need to be creative on a daily basis, and high performers are no exception. However, creativity is not just personal and individual. It is domain-based and cultural.

The degree to which people are encouraged to produce and submit new ideas, and the speed at which they are accepted and incorporated, are highly specific to one's domain. In some industries, new ideas take years to gain adoption.

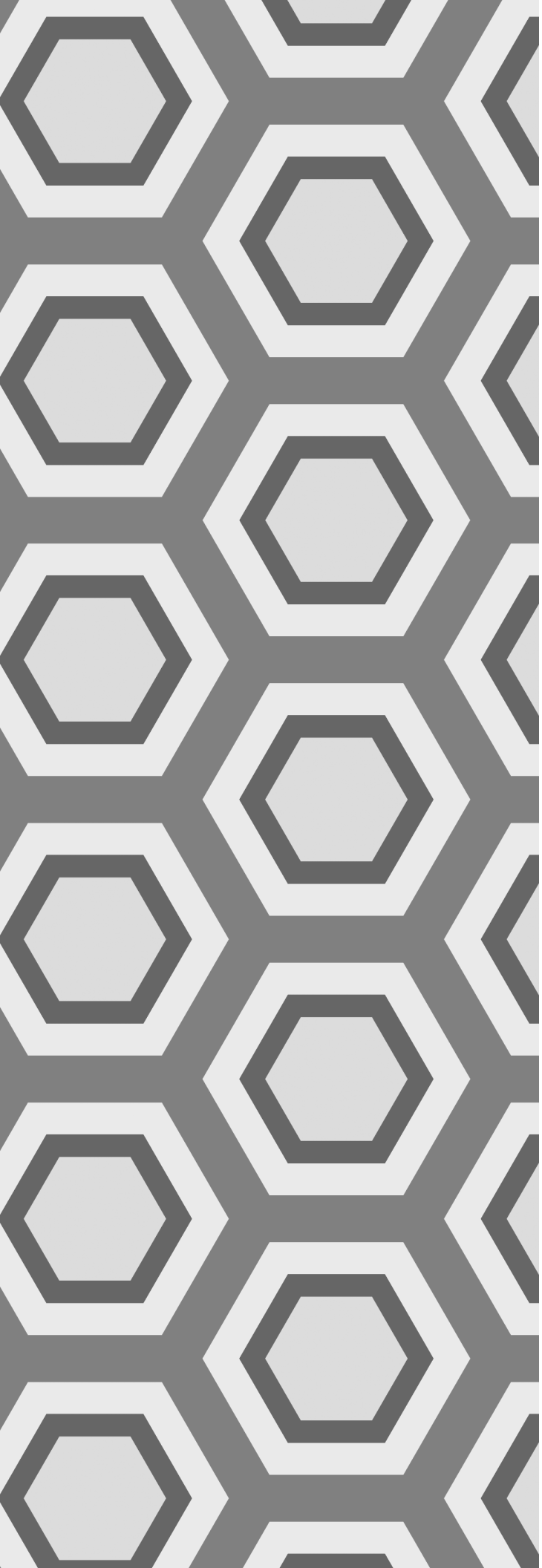
This presents challenges for large organizations in more traditional, conservative fields. It can be frustrating for innovation-minded individuals who want to feel like they are making an impact.

For a company, this could result in a difficulty in attracting and retaining top talent, who want to be given the opportunity to create work that makes a difference.

For a community (such as a library or a hospital), this discouragement results in low engagement, in people not wanting to visit, not wanting to linger, not feeling at ease or safe, and being easily distracted by other competing activities, such as video games, social media, TV, gossip blogs, and fragmented surfing of the internet.

Additionally, people need different amounts of collaboration and independence. They need the flexibility to dial in their individual needs for privacy, without compromising a neighbor's need for collaboration.

Fortunately, emerging solutions in tactile creativity are striking a balance between diverse needs to overcome many of these obstacles.



CHAPTER 2

DESIGNING FOR CREATIVITY

The Adoption Curve of Designing for Creativity

6 trends have set the stage for those who wish to design a built environment for creativity

TREND 1: PUBLIC ART

1970s to present—Art installations—from sculptures to murals to paintings—become ubiquitous in public spaces.

TREND 2: DESIGN THINKING

2007—Innovation and design thinking emerge as highly desirable, outcome-oriented creative frameworks for corporations and organizations who want to position themselves for growth by opening up new markets and expanding market share. The number of internal marketing agencies grows from 16% in 2008 to 58% in 2013[6]. Traditional advertising agencies find themselves competing for top talent with their own clients, and begin evolving into more specialized service firms such as technology, service design, and web development.

TREND 3: INTERACTIVE LEARNING

1980s - present—New science centers worldwide grow tenfold to more than 3,000, based on a growing demand for exposure to science, technology, engineering, and math at all ages. Studies show that interactivity enhances learning. According to Professor Per-Edvin Persson, these science centers are visited by more than 300 million people each year. [7]

2010 to present—Libraries continue to break with conventions, expanding from book-lending facilities to technology-friendly, inclusive environments where diverse, multigenerational visitors are invited to engage in interactive learning experiences, open-ended play, and creativity. Previously unheard-of, features such as maker spaces, teen spaces, and even climbing walls are becoming part of these new libraries of the future. Millennials in particular embrace the new libraries, and families look to libraries as recreational spaces to reconnect with each other, free of corporate influence and political agendas.

TREND 4: SENSORY DESIGN

2009 to present—The maturation of cloud technology along with a transition to knowledge work makes working remotely a practical option for many, blurring the boundaries between work and not-work.

Companies find they are no longer competing with other companies for top talent; rather, they are competing with their own employees' homes during business hours. As a result, corporations embrace a trend to transform themselves into community-oriented places that feel like home, only better, with gourmet chef's kitchens, catering, interactive gaming rooms, high-end ping pong tables, and espresso machines.

2013—Mindfulness, yoga, and health/fitness trends normalize mind-body awareness. Features like sitting/standing desks and balance chairs become widely adopted.

2015—Awareness of diversity in sensory needs leads to the rapid growth of private autism centers.

2016—A massive body of research shows that the environment can literally change our biology at a molecular level. This research begins to influence architects and designers.

TREND 5: GAMIFICATION

2017—Video games become exponentially popular. 65% of all households worldwide now have a device used for playing video games. The most frequent players use games as a social outlet—a chance to connect with friends or spend time with family. [8]

TREND 6: INTERACTIVE ART

2017 and beyond—Growing numbers of site developers seek to incorporate interactive art installations into their spaces to enhance the quality of social interactions and to build community. Tactile, interactive art installations incorporate many of the elements that have already been adopted, from public art, to design thinking, to sensory awareness, to gamification. Everbright is one example of a specialty installation. Other solutions are expected to emerge to meet the need for greater interactivity and creativity in the built environment.

The Solution: Designing for Creativity

Unlike cognition, creativity is an infinitely expandable resource. The more creativity is practiced, the more creativity can be produced. Put another way, if you want to be more creative, practice more creativity.

Research on human behavior and psychology allows us to conclude that when you design for creativity, you are also able to solve a host of other recognized problems (such as overstimulation and disengagement), while serving the larger mission of the organization to produce measurable outcomes (such as greater engagement, performance, and learning retention). (See The Creativity Brain Sequence.)

The most potent practice of creativity engages multiple senses simultaneously— particularly the senses of touch and vision.

5 PRINCIPLES TO DESIGN HABITATS FOR CREATIVITY

This section presents the physical requirements (supported by anthropology, psychology, and neuroscience) to inducing creativity in a public or shared space. The five principles outlined below are not intended to be an exhaustive or definitive list. They do provide a useful framework for those who want to understand the science and make the case to their team.

The five principles outlined below share many of the same properties as a habitat. When a space incorporates as many of these principles as possible, it will become an ideal habitat for creativity. When designing a new space, remember these human requirements for optimal creativity:

1. A novel, sensory experience produces insights

2. Hands accelerate thinking and learning (particularly language and literacy)

3. Edges matter for serendipity

4. Templates inspire creativity

5. Cocoons provide safety, autonomy, and routine

The Creativity Brain Sequence

How creativity happens in the brain

Creativity is surprisingly methodical, following a predictable, repeatable series of steps in the brain. Three systems work together to create something wholly new. An interpreter generates images, actors develop mental coherence, and a comparator helps test the validity of ideas. [9] This thought development spiral is as necessary to scientists as it is to artists.

1. Generate images.

The brain's interpreter generates images—inventing stories, myths, and concepts to explain experience. These concepts may be fanciful (like stories) or descriptive (like research analysis and scientific theory). People who image well see new connections between existing elements. The mind sketches the images it is holding before making a final drawing.

2. Perceive, make meaning, and respond.

Actors develop mental coherence through the following process:

1. Sense & perceive.

A sensor gathers input through sight, touch, hearing, etc.

2. Make meaning.

The mind organizes these sensations and makes meaning of them. As the brain explains sensory input to itself, the actor turns into a perceptor, "identifying with increasing clarity the environmental stimulus to which the senses have reacted. At first, identification is fuzzy and questioning, but eventually there is recognition."

3. Respond.

The actor transforms into a motor responder, "instructing the body to act on its environment in response to the sensory and perceptual interpretation it has developed. Motor responses link feelings and executive function in the brain, creating 'emotional actions' and meaning.

3. Test and evaluate.

John Zeisel writes: "This is the form of creativity that orchestra conductors, theatrical directors and literary editors practice. … This step parallels the test phase in research and design, and is carried out in the brain's comparator, which helps you determine how valid your images are, given your experience, so your brain can modify and improve the interpretation. … After the comparator modifies the holistic concept the interpreter has generated, a re-entry is made in the interpreter, and a new cycle of refinement and further interpretation begins."

PRINCIPLE 1: A novel, sensory experience produces insights.

People are more likely to have a novel idea when they are exposed to a novel, sensory experience. Spaces like corporate headquarters, hospitals, and libraries already incorporate sensory elements—such as access to nature, views, color, and daylight, based on scientific research on the benefits of providing basic sensory change and variability. For optimal creativity, consider incorporating a novel, sensory experience that involves the body.

Why are novel sensory experiences effective at producing insights? Flashes of insight may not happen in cubicles—but they don't require an indoor rock-climbing wall, either. A novel sensory experience—such as a walk outdoors, a swim, or a road trip—jolts the brain's neurons and seduces them into adapting to a new pattern, falling into the grooves of a new experience. As part of the mind focuses on navigating the physical experience, the rest of the mind can engage in a kind of meditative, unfocused thinking that yields unexpected insights. When the activity is physical, it is more likely to induce what Mihaly Csikszentmihalyi called a "one-pointedness of mind," made possible by the "close match between challenges and skills," the "clarity of goals," and the "constant availability of feedback." [10]

Evaluating a potential novel experience:

As you evaluate the options for a novel, sensory experience to incorporate into your space, avoid these potential pitfalls:

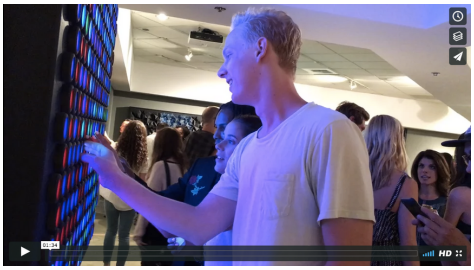
- Too much physical or social risk. (i.e., speedways, public dancing.)
- Time-intensive. Time is a real constraint—time to set up the project, time to clean up the project afterwards, and time to develop a set of constraints that enable anyone to create something beautiful. Permanent installations should remove "time" as a constraint for creativity.
- Excludes people of different abilities and ages. The sensory experience needs to be inclusive for all individuals. Also be mindful that one person's novel, sensory experience doesn't become another's off-putting distraction.
- Binary, easy-to-master games and other rule-based activities. The principle of adaptation dictates that when an activity's rules are easily mastered, people get used to it. We become restless and look to the next new thing to satisfy our need to overcome a challenge.

CASE STUDIES: CANDID FOOTAGE

A novel, sensory experience produces insights.

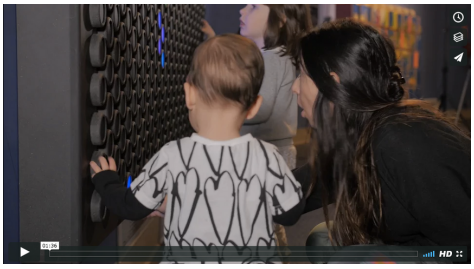
Watch this candid footage demonstrating how one solution, the Everbright interactive light board, is designed for creativity with this principle in mind.

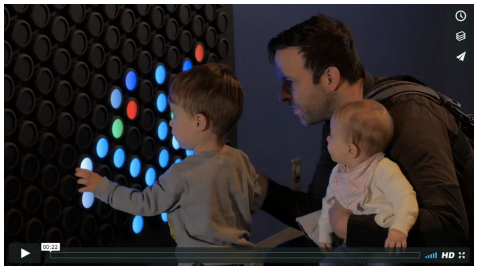
People are delighted when they make unexpected discoveries:
https://vimeo.com/229121772



A novel, sensory experience in a public space need not exclude people with disabilities:
https://vimeo.com/229122411

Or families with small children, such as this mother with her toddler:
https://vimeo.com/229123092





Or this father with his 4-year-old son:
https://vimeo.com/229123388

And his baby:
https://vimeo.com/229123631

PRINCIPLE 2: Hands accelerate thinking and learning.

Many people think of creativity as a localized function of the mind, separate from the body. But researchers believe that from our earliest beginnings, creativity began in the body, and more specifically in the hands. As Juhani Pallasmaa writes in The Thinking Hand, "The amazing mobile versatility, learning capacity, and apparently independent functions of the hand may not be a result of the development of the human brain capacity, as we tend to think, but the extraordinary evolution of the human brain may well have been a consequence of the evolution of the hand." He cites Marjorie O'Rourke, who notes, 'Aristotle erred in asserting that humans had hands because they were intelligent, Anaxagoras was, perhaps, more correct in stating that humans were intelligent because they had hands.' [11]

Hands activate creativity. Designers who understand this principle will seek out ways to incorporate touch and hand gestures into a shared space.

Why does using the hands accelerate thinking and learning?

Creativity and thought are the result of a fusion between hand, eyes, and mind. Humans think with our hands. We express with our hands. We need to gesture.

Manipulating an object with the hands, while looking at it with the eyes, is highly engaging for the brain.

As Frank R. Wilson writes, "The hand is so widely represented in the brain, the hand's neurological and biomechanic elements are so prone to spontaneous interaction and reorganization, and the motivations and efforts that give rise to individual use of the hand are so deeply and widely rooted, that we must admit we are trying to explain a basic imperative of human life." [12] Juhani Pallasmaa expands on this concept, writing, "The brain does not live inside the head, even though it is its formal habitat. It reaches out to the body, and with the body it reaches out to the world."

Benefits of using the hands to accelerate thinking and learning:

1. Gesturing and thinking with the hands boosts creativity—increasing the number and velocity of new ideas.

In a study of 54 children aged 8 to 11 years old published in Psychological Science, a journal of the Association for Psychological Science, children who were encouraged to gesture generated a greater number of novel uses for everyday objects than did the children who were not given any special instruction. Children who gestured normally produced 13 gestures, on average, while those who were specifically prompted to gesture produced about 53 gestures, on average. [13]

In other words, gesturing boosted creativity.

“Our findings show that children naturally gesture when they think of novel ways to use everyday items, and the more they gesture the more ideas they come up with. When we then asked children to move their hands, children were able to come up with even more creative ideas.”

Elizabeth Kirk, the University of York

2. Builds spatial intelligence and visual planning skills.

These are the basis for all high-level thought—starting with early literacy.

3. Hands are the foundation of speech and early literacy.

Architect Juhani Pallasmaa writes, “Recent anthropological and medical research and theories even give the hand a seminal role in the evolution of human intelligence, language and symbolic thought.” [14] He continues, “The very categories of language are created by intentional hand actions, so that verbs derive from hand movements, nouns hold things as names, and adverbs and adjectives, like hand tools, modify movements and objects. The focus here is particularly on how experiences of touch and grip [...] give language its directive power.” [15]

In other words, the body becomes a metaphor for the processes that the brain is engaged in.

Evaluating tactile activities that engage the hands and eyes:

As you evaluate the options for tactile activities that engage the hands, watch out for anything that lacks texture, requires too much time to set up, gets lost, makes a mess, excludes some individuals, does not aesthetically fit into the space, and takes up too much space:

- Lack of texture, not enough touch. Using the hands to touch buttons, slide things on screens, and wave them in front of a screen is not as engaging for the brain as using the hands to manipulate an object. Ideally, the activity should engage as many of our five touch receptors as possible, including the Meissner corpuscles (receptors), which "indicate such sensations as movement along the surface of the skin, feedback when objects are grasped, and an ability to detect low-frequency vibration, or flutter," and the Merkcel cells, which "are responsible for form and texture perception." [16]

- Requires too much time. Time to set up the project, time to clean up the project, and time to develop a set of constraints that enable anyone to create something beautiful. Permanent installations should remove "time" as a constraint for creativity.

- Materials get lost or scattered throughout the space, requiring constant replacement.

- Excludes (or overwhelms) people of different abilities and ages. Beware of tactile activities involving the hands that exclude some people.

- Doesn't look polished, keeping people from wanting to engage in hand-eye activities in your space.

- Space constraints—tennis is beautiful. It also requires the space for a tennis court, which is not the most efficient allocation of resources in a public or common space.

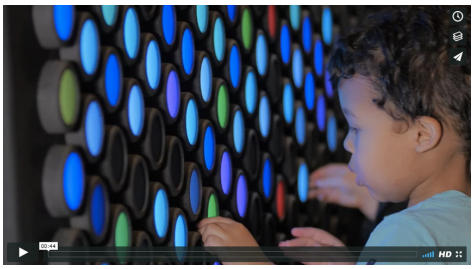
CASE STUDIES: CANDID FOOTAGE

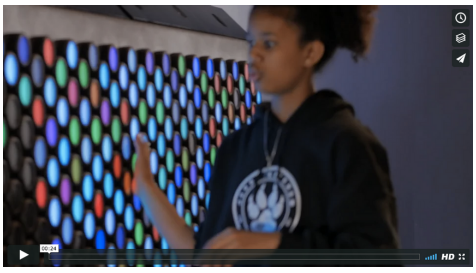
Hands accelerate thinking and learning

Watch this candid footage demonstrating how one solution, the Everbright interactive light wall, is designed for creativity with this principle in mind.

Humans evolved to think with our hands, and from birth we rely on gesturing, almost by instinct:

From toddlers:
https://vimeo.com/229123838

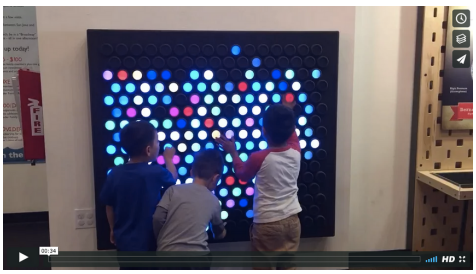




To teens:
https://vimeo.com/229124004

All people express their personalities through their hands—as you can see in this footage, you can tell a great deal about someone by watching the way in which they engage with their hands, whether they are methodical and deliberate, or spontaneous and sensory-seeking.

This footage of three boys show a range of interactions based on different personalities:
https://vimeo.com/229124133



PRINCIPLE 3: Edges matter for serendipity.

Every building has spaces along the edges where people are already naturally gravitating. (The scientific term is thigmotaxis.) We find safety and refuge along the margins. Typically used as a place to check email and text, these places have a high potential for serendipitous discovery and creative collaboration.

As Ann Susan and Justin Hollander write in Cognitive Architecture, “People avoid the center of open spaces and tend to stick to the sides of streets, even in car-free zones. Scientists believe it is “a survival and orientation strategy." The authors cite English geographer Jay Appleton, who proposed the prospect-refuge theory, which “describes how people are drawn to edges to protect their backs, and also seek safe spots to take in broad landscape vistas.” Thigmotaxis is “not only triggered when we take in vistas outdoors,” but also “when newcomers arrive at a party or first enter an empty restaurant and instinctively stand at the edge for a while to take in the scene, and then select a seat at the periphery. Anecdotally, it is rare to find someone seated in the center of an empty restaurant; they will usually dine more comfortably off to one side.” [17]

Why prioritize serendipitous collaboration?

People already gravitate toward the edges for safety—making this an ideal time and place for them to engage in open-ended creativity and collaboration. In doing so, an organization can:

1. Accelerate innovation.

Creativity depends not just on structured access to knowledge, but on serendipitous discoveries outside of one’s narrow field of expertise. Researchers believe that the most important characteristic of high performers is their willingness to go outside of their own areas. Even amongst specialists, the top performers have a habit of expertly linking together related concepts and sources beyond their immediate domain. Knowing that high performance depends on connecting and collaborating, there is no need to fill the edges of a physical space with display screens. Designing the edges for serendipity means you’re looking to enable people to spontaneously convene for creativity (and not just meeting and eating).

2. Inspire and attract top talent to a conservative industry.

Many industries are, by nature of their domains, unable to embrace rapid innovation. When a conservative organization facilitates its edges for serendipity and creativity, top talent are exposed to a stimulating environment of receptiveness to new ideas.

“Certain environments have a greater density of interaction and provide more excitement and a greater effervescence of ideas; therefore they prompt the person who is already included to break away from conventions to experiment with novelty more readily.”

Mihaly Csikszentmihalyi in Creativity

Evaluating features that activate the edges:

Make it easy and rewarding for people to go “outside their department” for knowledge, information, and feedback by creating a hook for them to do so—a clear goal that is small and therefore achievable, that anyone has time to do, and that everyone will want to do.

As you evaluate the options to incorporate in the edges of your space, watch out for anything that ignores the hands/eyes, turns into a passive observation, and does not invite people to spontaneously interact with each other.

CASE STUDIES: CANDID FOOTAGE

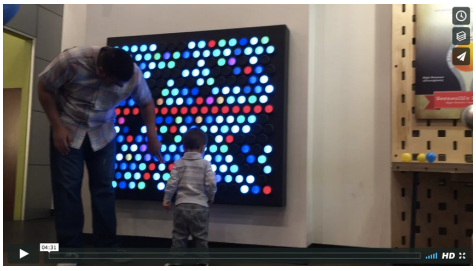
Edges matter for serendipity

Watch this candid footage demonstrating how the Everbright interactive light board is designed for creativity with this principle in mind.

Families gravitate toward the edges:
https://vimeo.com/229124466

Here, toddlers engage in networking:
https://vimeo.com/229124622

Older children are drawn to each other, and to the chance to create while standing side-by-side:
https://vimeo.com/229124712



What begins as a group project may end up as an independent creative pursuit, as this boy continues to linger to design something of his own, even after his father has moved on:
https://vimeo.com/229124940/204f02bbf7

PRINCIPLE 4: Templates inspire creativity.

Before going rogue, try going regular. People generate more ideas with templates than with brainstorming. Templates give people freedom to improvise, because the overall steps are already clear. Templates are a kind of constraint, and constraints are proven to amplify creativity. “People favor risk-free shortcuts,” write Ann Susan and Justin B. Hollander in Cognitive Architecture, and they “tend to shun things that require conscious effort and paying extra attention.” [18]

Research on how templates prompt creativity

Research shows that constraints make us more effective at creating new and useful ideas—and templates are much more successful than brainstorming and random idea generation. Consider the following research on how templates inspire creativity. Jacob Goldenberg, David Mazursky, and Sorin Soloman write in Science, “Ideas suggested by individuals working alone are superior to ideas suggested in brainstorming sessions and the performance of problem solvers instructed to 'break the rules, get out of the square, and change paradigms' was not better than that of individuals who were not given any instructions at all.” [19]

They continue, “Indeed, many ill-defined problems seem difficult, not because we are swamped by the enormous number of alternative possibilities, but because we have trouble thinking even of one idea worth pursuing.”

Cognitive psychology studies indicate that the detection and use of rules during the generation of ideas may even result in enhanced surprisingness (a dimension of creativity). For example, according to Perkins, adherence to a cognitive frame of reference involves sensitivity to the “rules of the game” and, by functioning within a frame, one achieves a better position from which to notice or recognize the unexpected.

“In a survey of ads, 89% of the award-winning ads contained one of six regularities, or “creativity templates.” Of these, about 25% could be schematically depicted as a simple template termed “Replacement.”
Benefits of using templates to inspire creativity:

“Regularities,” Goldenberg, Mazursky, and Soloman write in Science, “can serve as skeletons or an infrastructure for generating creative ideas. With these regularities defined, outlines of the main parameters can be fed those ideas that conform to these parameters."

“This framework is likely to produce ideas that are perceived as creative, even though the well-defined rules and the exhaustive search used to obtain them are not what we traditionally viewed as pure creativity. We must reappraise our fundamental approaches to creativity and reevaluate its operational definition.”

Goldenberg, Mazursky, and Soloman

Evaluating activities that incorporate templates to inspire creativity:

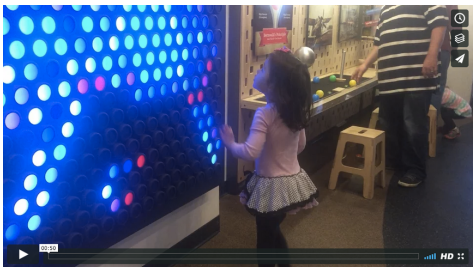
As you evaluate the options for templates that inspire creativity, watch out for anything that creates adaptation by having too much structure, and that doesn’t allow for flexibility and autonomy.

CASE STUDIES: CANDID FOOTAGE

Templates inspire creativity

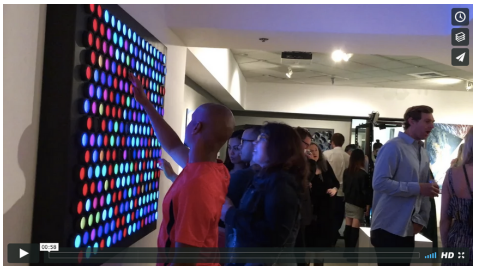
Watch this candid footage demonstrating how one the Everbright interactive light board is designed for creativity with this principle in mind.

Abstract, hexagonally-packed color dials provide a template to inspire creativity, helping to develop spatial intelligence and visual planning skills. Watch as this girl imagines what she wants to create (imaging), causes it to appear on the board (perceive, make meaning, and respond), then steps back to see the larger pattern, returning to bring her design closer to the one she has imagined (test and evaluate).
https://vimeo.com/229125203/d75470b696



As the girl returns to create something specific, she bridges the world of concrete creativity with that of the imagination, acting out what she has just designed:
https://vimeo.com/229125399/50283efb17

A seed pattern animation attracts a toddler with a novel sensory experience, then gives her a template to begin her own creative designs:
https://vimeo.com/229125608



Seed patterns attract adults as well:
https://vimeo.com/229125772

https://vimeo.com/229126074

PRINCIPLE 5: Cocoons provide autonomy and routine.

Highly creative people do not spend their days and nights immersed in brainstorming exercises, making fortuitous connections, and having epiphanies. The most creative people spend a great deal of time preparing for those moments, and revising them afterwards. Seated in rather uninspired chairs, they appear to plug away for hours, breaking away only to eat a turkey sandwich.

Cocoons can be both physical and time-based. A physical cocoon is a private space, free of potential interruptions, and not necessarily beautiful, where a person can put on headphones and get in the zone. A cocoon may also involve a predictable routine, habit, or schedule by creating regular expectations about where you work, and when it happens.

Why cocoons are vital for creativity:

1. Cocoons remove distractions, which cause depression and anxiety.

Creativity requires a familiar space for easy and uninterrupted concentration. Noise and other interruptions during complex work require a longer period of time to re-orient, and continued interruptions are likely to have negative effects on mood that reduce the motivation to resume work, according to a study cited by HOK. [20] The choice to not be interrupted, in a space and at a time where absolutely no one is likely to interrupt unless there is a true emergency, is still a luxury for many people—even in their own homes. While we can't do much to ensure that where we work and the public spaces we visit reflect our tastes, we can show up at the same familiar space every day where we can work easily and uninterrupted. This enhances creativity.

2. Cocoons provide the autonomy and structure that creative people need.

As wonderful as it is to have a novel, sensory experience to produce insights, and to embrace some form of tactile creativity with the hands, having a predictable rut (or routine) is just as vital for creativity, performance, and learning. An insight is not of much use if no one takes the time to flesh it out into a solution.

Evaluating potential cocoons for creativity:

The need for a cocoon—a place that provides autonomy and regularity for work—may seem like an obvious need in spaces like headquarters and libraries. However, airports and hospitals are also increasingly adopting cocoons, as they find that people of all ages and backgrounds have a need for quiet, uninterrupted focus. Consider the most elementary and easy-to-adopt ideas first. Many elements can comprise the right cocoon, from headphones to lighting to furniture. Headphones make a popular cocoon because they're portable, and do not impede on

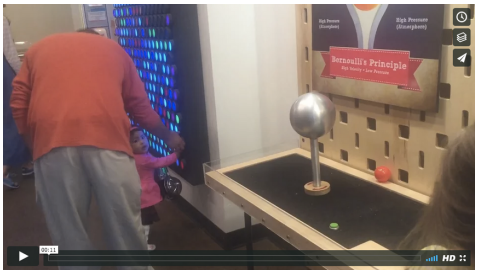
anyone else's experience of quiet and autonomy. This is key. (Some people need cocoons in the very same places where other people need to explore, connect, and have a stimulating experience. Look for solutions that can allow for both of these needs to be met in the same space, and at the same time.)

CASE STUDIES: CANDID FOOTAGE

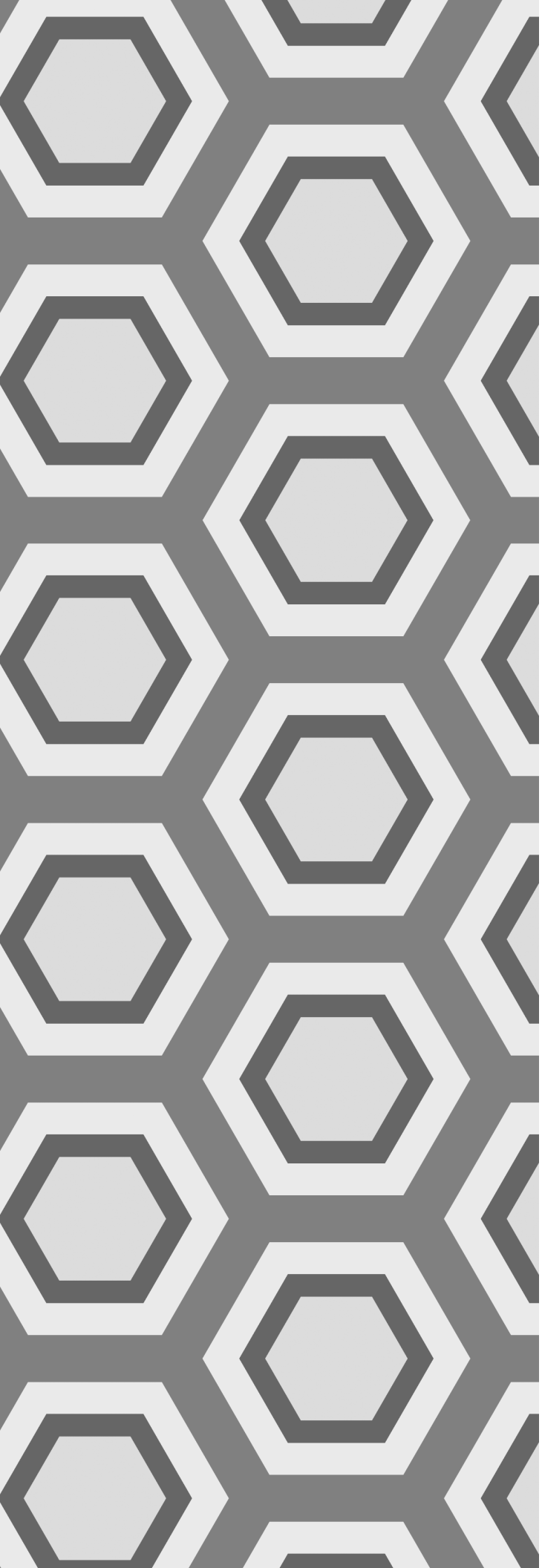
Cocoons provide autonomy and routine

Watch this candid footage demonstrating how the Everbright interactive light board is designed for creativity with this principle in mind.

A library provides an ideal cocoon for the autonomy and routine necessary for creativity. This 4-year-old girl demonstrates how the right novel, sensory experience can be perfectly appropriate in a library: https://vimeo.com/229126203



Creativity can become its own cocoon, allowing you to immerse yourself in flow—even if only for a few seconds. This father gets so absorbed in turning the color dials that he doesn't notice his baby daughter wander away: https://vimeo.com/229126364/8b40660135



CHAPTER 3

MAKING THE CASE FOR TACTILE CREATIVITY

You do not need to wait for the completion of a construction project.

New solutions are making tactile creativity seem doable for large organizations and high-use public spaces, without introducing undesirable constraints (such as pick-up, lost parts, and set-up).

Everbright by Hero Design is just one example of a solution, and there are sure to be others emerging in this space. Everbright makes an ideal habitat for creativity to incorporate into an existing space. Tactile, interactive creativity engages the hands, eyes, mind, and body, and plunges the mind into a deep state of creative flow. When tactile creativity is incorporated into the permanent design of a space, it provides a much-needed trigger for creativity—which has become elusive in the modern public space.

You may have observed that creativity is about setting up a series of counterpoints.

It is not simply about having a new perspective and being able to look out the window and see a vast view of the ocean; it is also about having a consistent, cozy place to work in which the same types of things tend to happen at the same times of day.

A vast, expansive view and a small nook are equally important to cultivating creativity in an organization.

Likewise, in a library, a centralized center for knowledge where people are focused on achieving a goal (such as finding and checking out a book) is the ideal home for engaging in open-ended creativity through tactile, sensory play.

WHY IS BUILDING OUT A NEW SPACE A GOOD TIME TO INCORPORATE CREATIVITY?

The best time to think about designing for creativity is when you are building out a new space.

Here's why:

1. Creativity has physical, environmental requirements.

Creativity is an endless, regenerative activity that people will never tire of. When you embed open-ended creativity into your interior, you will make creativity a permanent part of your space, and your culture. Creativity is a mindset, a way of thinking, that is continually reinforced through daily habits and practices of individuals and of the group. When everyone is consistently on the same page, magic happens.

2. The nature of work and public spaces means people will continue to be disoriented and overstimulated, and will need a grounding exercise.

Life will continue to pull us out of our ideal states of mind. People will never stop needing reminders that they are capable of getting back into a flow state, and that they are capable of finding a creative solution to any problem, by using their bodies, striking up unforced conversations with colleagues, and allowing their minds to rest meditatively and in an unfocused way on a problem.

Specifying for Creativity: A Punch List

Here are the factors to evaluate when you are considering an object's ability to facilitate creativity:

✓ What is required to begin creativity? How much time do you need to spend gathering materials and setting up? Does it require you to purchase and gather materials in advance?

✓ How much time is required to put it away? Does someone need to keep cleaning it up, picking it up throughout the day?

✓ How many people can use it at once?

✓ Are there any concerns about parts being lost, removed, stolen, or broken? Are replacement components readily available?

✓ Age usability: is it as easy and compelling to use for babies as it is for seniors?

✓ Appeal to people with diverse abilities: Is it as easy and compelling for people with autism as it is for people who have movement disorders? Is it ADA compliant—can it be easily enjoyed by someone in a wheelchair, and by a one-year-old?

✓ Is it durable under non-recommended uses? Subject to the impulses of 11-year-old unsupervised boys?

✓ Is it tactile and multidimensional? Does it allow each user to control the interactions, thereby avoiding overstimulation and boredom? Does it use both hemispheres of the body, so that hands cross the midline?

✓ Does it have an adaptation threshold, in which rules are easily mastered and it becomes less appealing? Or is it an open-ended activity that never stops being stimulating, entertaining, creatively rewarding?

✓ Is the feedback of an action clear and rewarding enough that multiple people can discover it, without requiring signage?

✓ Does it fit into a compact space? What kinds of architectural modifications does it require?

✓ Is it appropriate in a business and professional environment? Are there any restrictions on where it can be used?

✓ Can you customize it to fit the brand/space so that it is unique?

✓ Does it offer a choice of collaboration and working/creating independently?

CHAPTER 4

CONCLUSION

Beliefs about who is creative, and who gets to practice creativity, are changing.

We now recognize that creativity is the domain of all. In every industry, at every age, and for every profession, the ability to take a given set of constraints and imagine what's possible, then create something new for others to enjoy, is a universal human need. Practice makes this skill grow stronger.

Looking to embed creativity into your space?

Consider Everbright, an interactive light wall composed of hundreds of color dials that turn endlessly in either direction through the color spectrum. When presented with a large interactive light board with color dials, you must first imagine what you want to create. Your hand begins to work, while the brain starts to see a larger pattern. As the hands and the brain work in coordination, the brain is building planning skills, enhanced by a constraint of hexagonally packed dials. This type of tactile creativity is engaging some very high-level functions in the brain. Users must step back to see the larger pattern, then compare their real-world design with the one in their imagination.

Tactile creativity engages all sorts of people, whether they're highly spontaneous and physical or methodical and deliberate.

Visit: http://everbright.io/everbright

To request photos of installations in your industry, contact Kelly Parkinson. kp@hero-design.com or 415-323-5928

CHAPTER 5

RESOURCES

Resources
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