Transcend
BUILDING BEYOND THE LIMITS OF SCHOOL DESIGN

Designing for Learning

Cards and Activities to Support Teams in Applying Key Insights from the Science of Learning and Development

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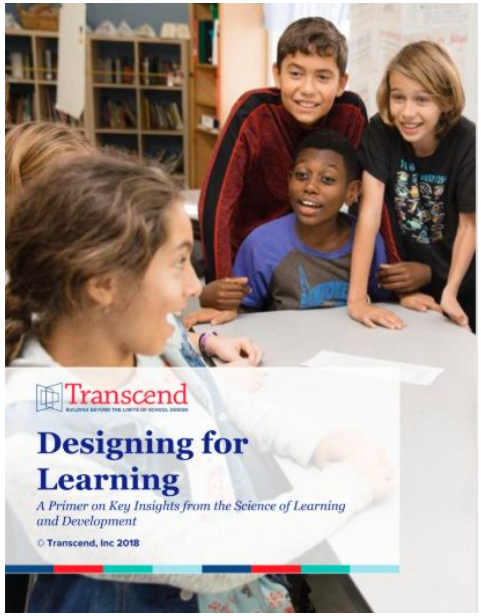
Welcome Designers

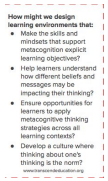
At Transcend, we support our school partners in using insights from many contexts to provoke thinking and inspire design. These contexts include their local community, the larger field of education, and the world beyond. The insights shared in our *Designing for Learning Cards* come from cognitive science, neuroscience, and psychology, among other disciplines. Each card highlights key research findings related to how learning happens and the implications for learning environments.

These cards supplement ***Designing for Learning: A Primer on the Science of Learning and Development*** and are meant to help you apply the ideas in that longer resource. If you have not yet explored that resource, please do so before working with these cards. It will help you gain a deeper understanding of how different factors—specifically cognition, motivation, identity, and individual variability—influence learning.



Assembling the Cards

Front



Back

On the pages that follow you'll find 16 design cards. Each one has a front and a back. The front contains one of the learning principles from the *Designing for Learning Primer*. The back contains the implications for learning environment, phrased as questions to inspire design and reflection. In order to assemble the cards you'll need to print them, cut them out, and finally do some folding and taping. You'll see a dashed line and a scissors symbol (✂) where you should cut. You'll see a solid line and a paper folding symbol (⇠) where you should fold. If you would like to acquire professionally printed versions please email **cynthia@transcendeducation.org**.

Engaging in Activities

There are many ways to use these cards. We've included two examples. The first focuses on brainstorming different ways elements of a learning environment can be designed to support learning. The second involves analyzing a learning environment—whether your own current environment, one you are designing, or one you're inspired by—to determine if it honors how learning happens. As you engage in these activities, keep in mind that while each of the principles discussed in the resource has critical implications for the design of learning environments everywhere, the specific decisions a community makes in order to honor them will likely be deeply contextual. To ensure the context is well represented, we encourage you to include kids, families, and others beyond the direct design team in these activities. In addition, while we encourage you to take this work on in pieces we also believe it's essential to account for all 16 principles shared in this resources. In other words, creating a design that overdials on one factor—for example by only accounting for the cognitive principles of learning—neglects a great deal of what's known about how learning happens. As a result, the model is not as likely to achieve great results for kids.

Designing with a Whole-School Perspective

While the insights shared on these cards have many classroom and instructional implications, we believe achieving truly outstanding and equitable results will require *every element of the traditional school model to be rethought*. At Transcend, we use the framework below to help think about the various "system elements" that must be designed and built in alignment to achieve a whole-school design. As you use the cards in this resource, we encourage you to work with this perspective in mind and not only design for instruction, but design for every element of your new, or redesigned, learning environment.

Curriculum, Pedagogy, and Assessment	The content young people learn, how they learn it, how they demonstrate that learning, and how they advance to new learning objectives.
Schedules and Routines	How learners move through time, for example, when they arrive and leave, how long they spend engaged in different experiences, and how this varies by learner.
Adult Roles and Adult Learning	How adults conceive of their roles, what knowledge, skill and experience profiles those roles demand, and the resources that support how adults communicate, interact, and develop.
Community and School Culture	The makeup, rituals, and climate of the entire learning community.
Community Partnerships	How learners, families, and staff interact with the broader world outside the immediate learning community.
Space and Facilities	How the physical surroundings influence learning, interactions, culture, and connection to the broader community.
Budget, Operations, and Logistics	How budgets are allocated, as well as operational dimensions such as transportation, nutrition, and meal systems.
Ongoing Learning, Improvement, and Innovations	How everyone in the learning community understands success and progress, learns and reflects together, and influences the evolving model.
Technology and Tech Infrastructure	How learners, families, and school staff engage in online learning and collaboration; build digital fluency; and connect to educational opportunities in the broader world via technology.

Cognition

The set of processes by which individuals take in both new and familiar stimuli from the world around them, process these stimuli into memories, and retrieve these memories to inform their day-to-day decisions and actions.

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Principle #1:
Focused Attention

Principle #2:
Manageable Cognitive Load

Principle #3:
Meaningful Encoding

Principle #4:
Effective Practice

Principle #5:
HIgh-Quality Feedback

Principle #6:
Metacognitive Thinking

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Motivation

The willingness to start, put in mental effort, and persist even in the face of challenges.

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Principle #7:
Value

Principle #8:
Self-Efficacy

Principle #9:
Sense of Control

Principle #10:
Constructive Emotions

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Identity

How individuals make meaning of their unique combinations of personalities, physical characteristics, group memberships, values, beliefs, attitudes, and life experiences.

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Principle #11:
Self-Understanding

Principle #12:
Sense of Belonging

Principle #13:
Navigating Identity Threats

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Individual Variability

The various cognitive, social, emotional, and physical ways by which individuals differ that affect—and are affected by—the environments, experiences, and relationships they encounter throughout life.

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Principle #14:
Life Experiences

Principle #15:
Developmental State

Principle #16:
Learning Differences

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Cognition

Principle #1:

Focused Attention

People learn best when they direct their focus toward the content and experiences most relevant to learning.

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How might we design learning environments that:

- Help learners feel physically and psychologically safe and healthy?
- Ensure learning objectives and activities are clear?
- Minimize sensory distractions?

Cognition

Principle #2:

Manageable Cognitive Load

People learn best when they are challenged but are processing a manageable amount in their working memory.

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How might we design learning environments that:

- Minimize cognitive and emotional distractors?
- Break learning into manageable, logically sequenced increments?
- Represent content and experiences clearly?
- Respond to individual learner readiness with tailored supports and pacing?
- Ensure individual learners achieve competency with prerequisite objectives before they move on?

Cognition

Principle #3:

Meaningful Encoding

People learn best when new learning is experienced in memorable ways and is related to prior knowledge.

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How might we design learning environments that:

- Promote distinctive or emotionally compelling learning experiences?
- Ensure learners connect new learning to their prior knowledge and experiences?
- Help learners make underlying factual and conceptual connections?
- Integrate multiple representations of content through different modalities, problem types, and contexts?

Cognition

Principle #4:

Effective Practice

People learn best when they practice challenging-but-doable skills at frequent, focused intervals and across diverse contexts.

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How might we design learning environments that:

- Use each learner's current proficiency to plan opportunities for practice?
- Provide learners with ongoing opportunities to engage in focused, frequent practice, across diverse contexts?
- Build learners' own understanding of effective practice?

Cognition

Principle #5:

High-Quality Feedback

People learn best when they receive timely and targeted feedback to guide their improvement.

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How might we design learning environments that:

- Build learners' understanding of what success looks like?
- Offer sufficient, timely opportunities for giving and receiving feedback so learners can improve?
- Ensure feedback provides a sufficient and accurate analysis of a learner's progress and guidance for improving?

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Cognition

Principle #6:

Metacognitive Thinking

People learn best when they are able to plan, observe, evaluate, and adjust their own learning processes.

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How might we design learning environments that:

- Make the skills and mindsets that support metacognition explicit learning objectives?
- Help learners understand how different beliefs and messages may be impacting their thinking?
- Ensure opportunities for learners to apply metacognitive thinking strategies across all learning contexts?
- Develop a culture where thinking about one's thinking is the norm?

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Motivation

Principle #7:

Value

People learn best when they find the content, outcomes, processes, and relationships associated with learning important and relevant.

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How might we design learning environments that:

- Ensure *what* is being learned feels relevant to learners' interests and goals?
- Ensure *how* learning occurs feels compelling to learners?
- Enable learners to work with peers and adults with whom they have meaningful relationships?
- Only use extrinsic rewards sparingly and to support progress toward intrinsically motivating goals?

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Motivation

Principle #8:

Self-Efficacy

People learn best when they believe in their ability to grow and achieve mastery of what they are learning.

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How might we design learning environments that:

- Engage learners in tasks that are challenging but doable?
- Help learners regularly set goals, plan toward them, and reflect on their progress?
- Reframe failure as a temporary state that can be changed by changing one's behavior?
- Ensure learners have trusted adults from whom they can seek help when they feel insecure about their abilities?

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Motivation

Principle #9:

Sense of Control

People learn best when they perceive that they have meaningful and appropriate agency over their learning.

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How might we design learning environments that:

- Provide appropriate autonomy over when, where, or how learning is pursued?
- Help learners attain the supports and resources needed to achieve their goals?
- Minimize external barriers to learning?

Motivation

Principle #10:

Constructive Emotions

People learn best when they are in constructive emotional states versus feeling excessive stress or anxiety.

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How might we design learning environments that:

- Are warm and and joyful spaces?
- Foster positive relationships between peers as well as between adults and learners?
- Support physical and psychological health and wellbeing?
- Help learners diffuse negative emotional states?

Identity

Principle #11:

Self-Understanding

People learn best when they have a deep understanding of who they are and can use this knowledge to maximize their learning.

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How might we design learning environments that:

- Deepen learners' understanding of their life story, heritage, and community?
- Immerse learners in new contexts and activities?
- Offer opportunities for learners to express their various changing identities?
- Help learners reflect on their current identities, desired future identities, and how best to bridge the two?

Identity

Principle #12:

Sense of Belonging

People learn best when they feel connected to, and accepted by, the people and environment around them.

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How might we design learning environments that:

- Are relevant to and celebrate learners' identities?
- Provide all learners with opportunities to be heard and encourage participation?
- Hold high expectations for all learners?
- Help learners understand self-doubt happens to everyone?
- Minimize zero-tolerance and utilize restorative practice to re-establish trust and connectedness?

Identity

Principle #13:

Navigating Identity Threats

People learn best when negative beliefs associated with their identity are minimized or buffered against.

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How might we design learning environments that:

- Cue learners' motivating identities over identities that may trigger stereotypes or self-doubt?
- Minimize actions, words, or images that may trigger stereotypes or feelings of self-doubt?
- Expose learners to individuals who have countered identity threats?
- Support learners in understanding and acting against systemic inequity and personal experiences of bias?

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Individual Variability

Principle #14:

Life Experiences

People learn best when their unique life advantages and adversities are understood and responded to.

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How might we design learning environments that:

- Understand the unique privileges and adversities that each learner carries?
- Ensure each learner is supported by a caring adult?
- Use trauma-informed practices to respond to adverse experiences?
- Provide or connect learners and their families with non-academic resources and supports?
- Leverage assets in learners' home and community contexts to support learning?

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Individual Variability

Principle #15:

Developmental State

People learn best when their experiences align with where they are developmentally.

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How might we design learning environments that:

- Support key developmental tasks that occur across different phases of life?
- Respond flexibly to reach all learners at their *unique* developmental zones physically, cognitively, socially, and emotionally ?
- Support learners in understanding and responding to their own development?

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Individual Variability

Principle #16:

Learning Differences

People learn best when their unique learning needs are identified and resources and supports are aligned with these needs.

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How might we design learning environments that:

- Ensure individual learners' unique needs and strengths are understood by adults and learners themselves?
- Respond to differences by enabling learners to take in, engage with, and demonstrate learning in different ways?
- Provide tailored scaffolds and supports in response to specific needs?
- Maintain high standards for all learners no matter their unique needs?

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Activity 1: Generating New Design Ideas

This activity will help you quickly develop new design ideas that honor research on learning. It involves using the "How might we…?" questions on the back of each design card to provoke thinking and generate ideas related to various elements of a learning environment's design. The variations on the next page also show 1) a more structured way to generate expansive ideas and 2) a way to think about design decisions you want to avoid.

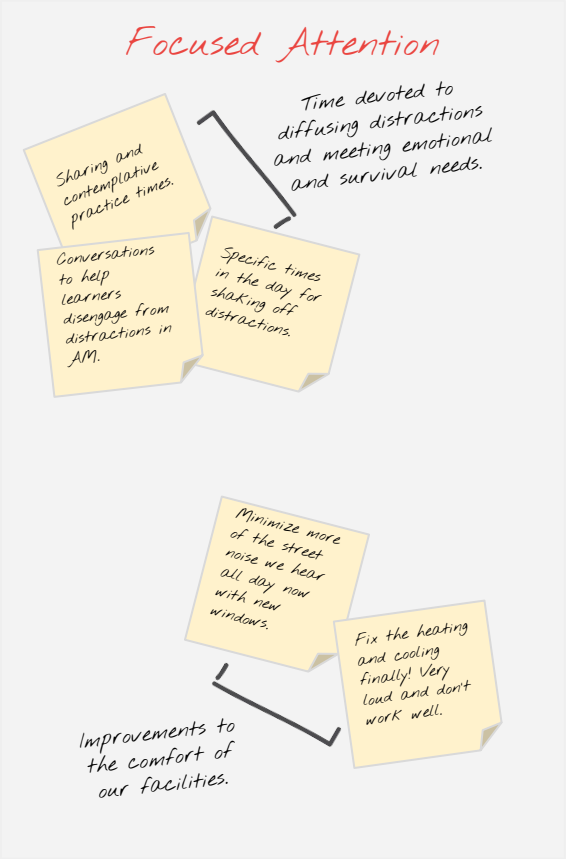
General Steps

1. **Review the content.** Everyone involved in this activity should be familiar with the ideas in the *Designing for Learning Primer* before getting started.

2. **Select principles.** Determine which principles you want to focus on. Don't try to take them all on at once. For example, consider starting with the principles associated with just *one* factor, such as identity.

3. **Brainstorm ideas.** Engage in rapid, generative brainstorming—don't worry about whether ideas overlap, seem too big or too small, or feel hard to implement. To do this, use the "How might we design learning environments that…?" questions associated with each principle to spur your thinking. For example, ask yourself, "How might we design learning environments that help learners feel physically and psychologically safe and healthy?" To generate ideas quickly and allow for flexibility later, try using sticky notes for brainstorming ideas and placing them on different pieces of chart paper for each principle you decided to focus on.

4. **Review and refine.** Go back through your list of ideas and refine them by collapsing similar ideas together and adding more details. If you used sticky notes and chart paper you can physically move the stickies into groups, circle these groups, and label them.



The graphic above show what steps 3 and 4 might look like if you're using chart paper and sticky notes.

Variation 1: Use System Elements to Expand Thinking

As mentioned in the introduction of this resource, successfully designing a learning environment requires the alignment of many resources, systems, and structures. As a variation on the general steps for this activity, think about how you might design each of the "system elements," on page 3, in support of the principles you're focused on. Try using a template like the one depicted below to do this.

System Element	Design Ideas
Curriculum, Pedagogy, and Assessment	
Schedules and Routines	
Adult Roles and Adult Learning	
Community and School Culture	
Community Partnerships	
Space and Facilities	
Budget, Operations, and Logistics	
Ongoing Learning Improvement and Innovations	
Technology and Tech Infrastructure	

Variation 2: Brainstorming Design Decisions that Violate Research

There are many ways that learner environment may violate the principles related to how learning happens. Brainstorming these violations can be eye-opening. As a variation on the general steps for this activity, try brainstorming using the question stem, "How might some learning environments NOT…?" When you're done, step back and consider if any of these design decision describe your current model or traditional school models in general.

Activity 2: Auditing Your Learning Environment

This activity will help determine the extent to which your current learning environment aligns to the research on how learning happens. It involves determining whether the environment honors, violates, or is neutral on each of the principles related to cognition, motivation, identity, and individual variability. The variations on the next page also show how additional perspectives can be brought into this process and how you can use observations.

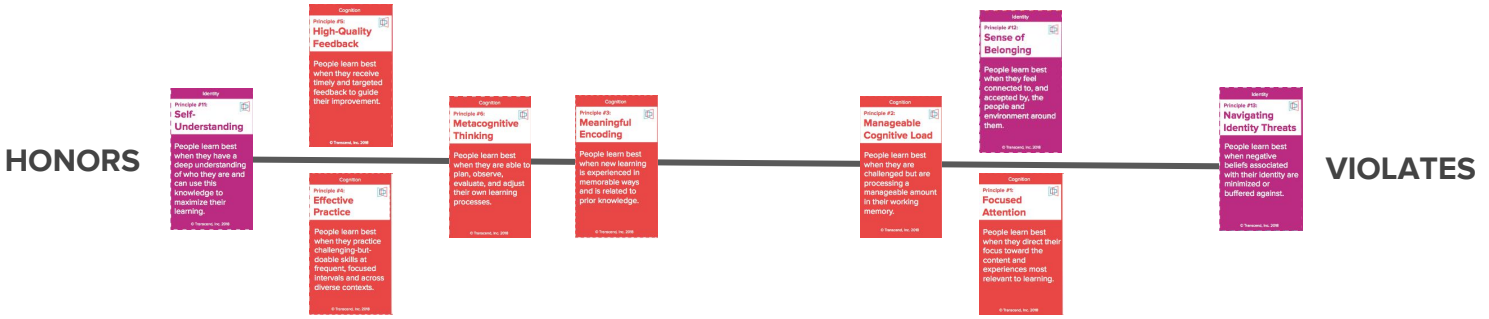
General Steps

1. **Review the content.** Everyone involved in the audit should be familiar with the principles you'll be auditing for and the related implications for design before getting started.

2. **Select principles.** Determine which principles you want to focus on. Don't try to take them all on at once. For example, consider starting with the principles associated with just *one* factor, such as identity.

3. **Conduct your audit.** One by one consider each principle you've chosen to focus on and the extent to which your environment *honors*, *violates*, or is *neutral* on the principle. Then, place the associated card on a spectrum with honors at one end, violates on the other, and neutral in the center. As you go, jot down evidence for your assessment somewhere—this is critical!

4. **Act on your audit:** Now it's time to adjust your design! Go principle by principle—focusing your attention on those in the neutral or violates end of the spectrum—and think about changes you could make to the design of the environment to further honor how learning happens. Use the questions on the back of each card to spur thinking.



The graphic above shows what your audit process will look like after step 4.

Variation 1: Inviting in Different Perspectives

The general steps for this activity ask you to audit your current learning environment based on what you already know about it. However, often times you'll be missing some information. This is because your perspective on the environment is only one of many. For example, what would learners say about your environment's alignment to research? In order to find out, engage in one of the following:

- **Include stakeholders beyond the design team in the audit**. Engaging learners, family members, community members, or other staff members beyond your design team in the audit process is a great way to bring in different perspectives and get a more complete picture!
- **Conduct interviews to deepen understanding of other perspectives**. You can also learn from others through interviews and then use this information in your audit. If you plan to do this, use the backs of the design cards to help you generate questions. For example, "Tell me a bit about the extent to which you feel safe and secure in our school and why?"

Variation 2: Observing for Alignment

Another way to broaden your perspective is to go observe. This will prevent you from relying just on what you remember, which might be clouded by personal feeling or be out-of-date. Also, this approach allows you to narrow your focus and think more deeply about one part of a learner's experience. For example, you could drop into the same space a few times over the course of a week, observe and take notes, and then use these notes in an audit. Be creative about the spaces you observe as well—don't limit yourself to classrooms. Why not go observe the lunch space, recess, an adult professional development space, or the front entry way in the morning? This will help to highlight concrete examples of different principles in action. Later, as you audit, also remember to go deeper than just what you observed and ask: What policies, rules, elements of culture, etc. influenced how well this principle was enacted?

Variation 3 Audit an Environment that Inspires You

You can learn a lot from auditing learning environments other than your own too! So, try adding a variation on the general steps by focusing on a learning environment that you're inspired by and want to learn from. You can do this by observing the environment in action in the ways described in Variation 2. You can also do this by reading about the learning environment or watching videos. You could even do interviews with member of the community. Once you've collecting information, complete your audit. Then, consider how these learnings might inspire you to make changes in your own environment.