

The Science of Learning and Development

This brief is the first in a four part series, [Relationships, Routines, Resilience: Reopening with the Three Rs](#), designed to share some of the key practices, strategies and structures to support students' return to in-person school. Each brief includes the science grounding, implications for practice, and resources.

THE SCIENCE

As children return to school over the next few months, we can anticipate their eagerness to learn and their excitement about being with friends and teachers. We can also anticipate their anxiety as they re-adjust to the social pressures and structures of a school environment, not to mention their need to continue processing the disruption and stress of the past year. We know that the hardships of the past year have fallen disproportionately on communities of color where people face ongoing racial oppression and a greater toll from COVID-19.

This moment calls for a hard reset. The science of learning and development provides the grounding for experiences and environments that each student will need in order to engage, learn and thrive. Key scientific facts behind the Three Rs include:

Development is Bi-Directional

The ongoing, dynamic interaction between nature and nurture – our genes and environment – drives all development. Although our DNA is composed of over 20,000 genes, fewer than 10% are ever expressed. Cues from our social and physical world initiate a chemical process in our bodies, which determines which genes are expressed, along with how and when. This back-and-forth biological process, called *epigenetic adaptation*, highlights the malleability of the development of our brains and bodies.

Context Matters

The malleable nature of development is both an opportunity and a vulnerability, depending on the context. A child's context includes the relationships, environments, and societal structures they interact with both directly and indirectly – all of which play a critical role in the dynamic nature of development. A safe and affirming environment, attuned and responsive relationships, and rich instructional experiences support healthy development and learning. Schools capitalize on this positive context when they connect to, leverage, and build upon the assets of students' culture and communities as an inherent part of the educational experience.

In a negative developmental context, chronic stress, especially in the absence of a buffering adult, can affect the developing neural architecture critical for learning, putting children on "high alert" for danger. These experiences can include adversities in a child's immediate context (such as abuse or neglect), and also in a child's larger, societal context (such as systemic racial oppression).

Learning is Integrated

Learning isn't "academic" OR "social and emotional" – students become increasingly capable of complex skills through the integration of their cognitive, social, and emotional development. The brain's architecture is made up of trillions of connections, forming complex and integrated structures as experiences create, strengthen, and reorganize connections and eliminate unused pathways. The brain becomes highly connected, efficient, and specialized over time. No part of the brain develops in isolation – it is structurally and functionally integrated.

THE PRACTICE

While the pandemic has exposed the inequities and vulnerabilities of our system, the science points the way to create the conditions that unleash the potential in every student. The new Three Rs describe the supports students will need most as they return to school. Each of these supports (drawn from Turnaround's broader [Whole Child Design Blueprint](#)) will be detailed in the next three briefs. They are:

RELATIONSHIPS

Relationships are the “active ingredient” in the learning environment. They are supported through intentional structures and strategies that connect every child with caring adults.

ROUTINES

Our brains are prediction machines. Safe, supportive environments allow our brains to focus on learning and not get distracted by the need to find patterns and make order. That's why norms and expectations, clear instructions, and predictable schedules help students' brains stay calm for learning.

RESILIENCE

Resilience is a skill that can be built like a muscle. Self-awareness and self-regulation are foundational to resilience. Teachers can support students by helping them recognize and manage their emotions through practices like co-regulation, mindfulness, and movement.

District and school leaders play an important role in facilitating the Three Rs. They can consistently and clearly communicate and reinforce their commitment to equitable whole-child education. To be successful, they should lead inclusively, focus on building staff capacity, and consistently support staff collaboration and relationships.

RESOURCES

- ❑ Turnaround's Toolbox for Whole Child Design - [Science Pages](#)
- ❑ Turnaround's [Whole Child Design Blueprint](#)
- ❑ The SoLD Alliance [website](#)
- ❑ Greater Good Science Center's [California SEL Modules](#)

