

# Neuroscience-Backed Teaching Strategies

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## Simple Strategies for Smarter Teaching





# Using Neuroscience to Revolutionize Your Teaching Strategies

What if a simple change in your teaching could significantly impact how effectively your students learn? It's a powerful thought.

Neuroscience has given us the tools to do precisely that. As teachers, we often rely on intuition and experience, but **a growing body of research can guide us to make smarter, more effective teaching choices.**

The best part? You don't need to be a brain expert to apply these insights. In this eBook, you'll learn how **small, science-backed shifts in your teaching can lead to better student engagement, memory retention, and overall success.**

# The Science Behind Learning

Understanding how the brain works can completely transform how you approach teaching. Neuroscience reveals key principles that show us how students learn best. Here's a breakdown:

## 1 Neuroplasticity

The brain is not fixed. It can change and reorganize itself throughout life, which means that every student, no matter their starting point, has the potential for growth. This **ability of the brain to adapt through repeated practice is called neuroplasticity**, and it highlights how small, consistent changes in your teaching can have a lasting impact on student learning.

## 2 Memory Systems

The brain stores information in multiple systems: short-term memory, working memory, and long-term memory. Working memory, which holds information temporarily for processing, has limited capacity. When students are overloaded with information, their brains struggle to absorb it. **Neuroscience recommends breaking down lessons into manageable chunks and allowing time for consolidation.** This process, known as "chunking," makes learning more efficient and improves retention.

## 3 Attention

**Studies show that students can focus for only 10 to 15 minutes before their attention starts to wane.** The brain craves variety and engagement. If you try to lecture for an hour without changing the activity or format, you risk losing your students' attention. **Frequent shifts in teaching methods, combined with breaks, help keep students engaged.**

## 4 Emotion and Learning

Emotion plays a critical role in learning. **Research shows that positive emotional states improve memory and make learning more efficient.** When students feel safe, supported, and engaged, their brains are more likely to absorb new information. Creating a classroom environment that encourages emotional connection can significantly boost learning outcomes.

These insights into how the brain works can help you design lessons that are not only more engaging but also more effective in helping students learn.



# Myths About Neuroscience in Education

While neuroscience offers valuable insights, many myths exist in the world of education about how these findings should be applied. Let's set the record straight on a few common misconceptions:

## 1 We only use 10% of our brain

This myth has been widely debunked. In reality, we use almost all parts of our brain for different tasks. While different areas of the brain specialize in different functions, virtually every part of the brain has a role in learning and cognition.

## 3 More breaks equal more learning

While brain breaks are beneficial, overdoing them can disrupt the learning flow. **Neuroscientific research suggests that breaks are most effective when strategically timed after periods of focused attention.** Constant interruptions can lead to disengagement. The key is to use breaks wisely, giving students a chance to reset without interrupting the learning process.

## 2 Learning styles are the key to teaching

The idea that students learn better when teaching aligns with their preferred learning style (e.g., visual, auditory, kinesthetic) is a popular but misleading notion. **What works better is varying teaching methods to engage different parts of the brain** and provide a rich learning experience for all students.

## 4 Teaching is a one-size-fits-all

One of the most damaging myths in education is that what works for one student will work for all. In truth, neuroscience tells us that **personalized learning—adapting lessons to meet students' individual needs and interests—leads to better learning outcomes.** Understanding and responding to these individual differences is key to effective teaching.

# 5 Instructional Strategies Backed by Neuroscience

Now that we understand how the brain works and the common misconceptions, let's dive into actionable strategies that align with neuroscience principles:



## Chunking

The brain processes information best when it's broken down into small chunks. Instead of delivering an entire lesson at once, **break it into manageable segments with brief pauses in between.** This allows students to absorb and consolidate the information more effectively.



## Brain Breaks

**After about 10–15 minutes of instruction, students need a short break to reset.** This could be a brief physical activity or a fun, interactive game. Research shows that short, well-timed breaks can improve focus and enhance memory retention. Implementing these breaks helps keep students engaged and fresh.



## Personalized Learning

**Neuroscience shows that students learn better when new information is tied to something they already know or care about.** Ask students about their interests and use this information to make your lessons more relevant and engaging. For instance, if students are passionate about sports, use sports statistics to teach math concepts.



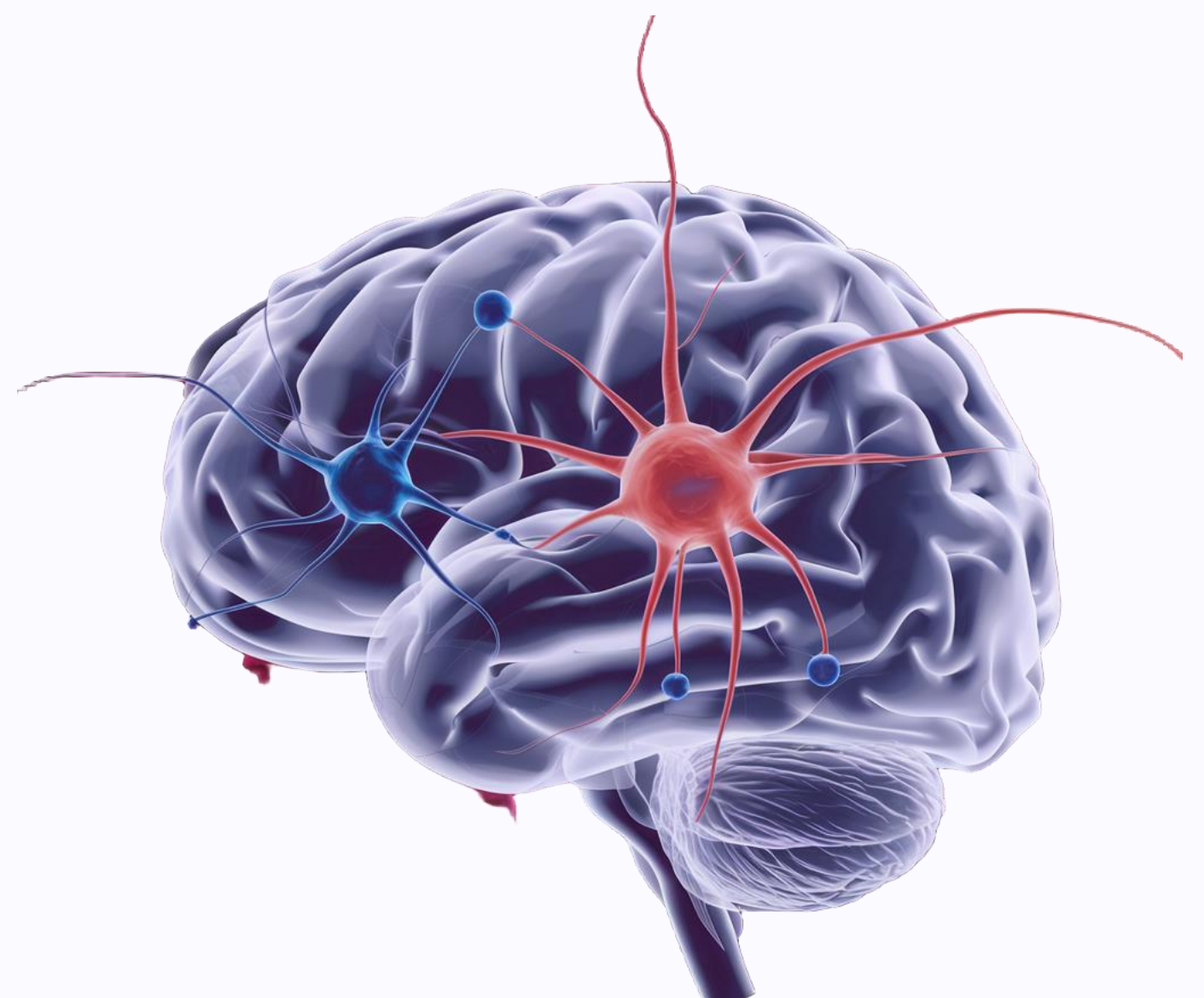
## Active Retrieval

Retrieval practice—the process of pulling information from memory—strengthens neural connections. **Use strategies like quick quizzes, peer teaching, or think-pair-share activities to get students actively recalling what they've learned.** This helps move knowledge from short-term to long-term memory, improving retention.



## Use Visuals and Multimedia

**The brain processes images much faster than text alone.** Incorporating diagrams, videos, and interactive media can help students grasp complex concepts more easily and make lessons more engaging. Visuals activate different parts of the brain, improving understanding and retention.





# Must-Read Books and Articles That Will Change Your Teaching

If you want to dive deeper into neuroscience and teaching, here are some must-read resources that will help you apply what you've learned in the classroom:

- **"Make It Stick: The Science of Successful Learning"** by Peter C. Brown, Henry L. Roediger III, and Mark A. McDaniel: This book explains how memory works and offers practical strategies for making learning more effective.
- **"The Brain-Targeted Teaching Model for 21st-Century Schools"** by Mariale M. Hardiman: Hardiman offers a framework that applies neuroscience principles to teaching, with practical tips for creating brain-friendly classrooms.
- **"Teaching with the Brain in Mind"** by Eric Jensen: A guide for teachers to understand how neuroscience applies to classroom instruction, focusing on practical strategies for engagement and retention.
- **"Neuroscience for Teachers: Applying Neuroscience in the Classroom"** by John Geake: This book breaks down the key neuroscience findings that can improve your teaching, offering real-world applications and teaching strategies.
- **"The Mysterious Power of Brain Breaks"** Edutopia: Learn about the importance of brain breaks and how they can help reset focus and improve memory retention in this short Edutopia blog.



# Designing Brain-Friendly Lessons with Radius

Radius is more than just a lesson planning tool—it's a way to apply neuroscience insights directly into your teaching. Here's how Radius can support your efforts to create brain-friendly lessons:

- 1. Neuroscience-Informed Lessons:** Radius helps you design lessons based on neuroscience principles, like breaking information into chunks and catering to different learning styles. By simply telling Radius your teaching goals, you can receive a lesson plan tailored to how students naturally learn, improving engagement and retention.
- 2. Brain Breaks with Radius:** Use Radius task cards and interactive games to incorporate brain breaks throughout your lessons. These activities help students reset their focus and improve learning outcomes.
- 3. Personalized Learning:** Neuroscience shows that students engage better when lessons connect to their lives. Tell Radius about trends, music, or topics your students care about, and it will create lessons that are both relevant and aligned with standards.
- 4. Active Learning with Radius:** Radius makes it easy to incorporate problem-based and project-based learning. These teaching methods engage the brain by encouraging critical thinking, problem-solving, and collaboration. Radius can generate project ideas, group activities, and real-world problem-solving scenarios that promote active learning.

By using Radius, you're not just creating lessons—you're designing learning experiences that align with how students' brains work, ensuring they stay engaged and retain more.