



Issue 103

How the Five Senses Prepare Children and Youth to Understand the Brain — and Why This Matters

Children and youth live in a world filled with constant stimulation, emotional overload, and impulsive decisionmaking. BrainWise CPR's first-response skills begin by having children identify problems they and others face, then segue to the five senses to help them connect real-life experiences with their brain.

Learning about the five senses is the brain's first line of information — the "sentinels" that alert us to what is happening around us — that helps children understand how to use their brain to protect them. Before children can understand how the brain learns, changes, and builds thinking skills, they need to understand how information gets into the brain in the first place. This is where their body steps in.

Research on the Sense of Touch.

In 2021, the Nobel Prize in Physiology or Medicine was awarded to Dr. David Julius and Dr. Ardem Patapoutian for discovering how molecular sensors in the skin and nerves activate when we touch something, feel temperature changes, or experience pain. Their research identified the exact receptors that allow the nervous system to detect heat, cold, and pain and convert physical experiences into electrical signals that travel to the brain.



The Sense of Touch Sends a Signal to the Brain's Relay Center

This research supports the approach the BrainWise program takes to teach children thinking skills. Although Julius and Patapoutian focused on touch, scientists agree that all senses follow the same basic pathway taught in BrainWise:

1. A sensory receptor detects something in the world.
2. It converts that information into an electrical signal.
3. The signal travels along nerves to the thalamus, the brain's major relay center.
4. The thalamus sends the signal to the limbic system, where the amygdala and hypothalamus trigger emotional and survival reactions.
5. Only after thinking skills and neural pathways to the Wizard Brain (prefrontal cortex) are established are children able to Stop and Think before reacting.



The Five Senses Send Signals to the Brain's Relay Center (Thalamus)

This sequence is essential to BrainWise. It shows why children often react before they think: Their senses send signals to the emotional and survival centers of the brain *before* the thinking centers are fully engaged.

From Sensory Signals to Neuroplasticity. Once students understand this sensory-to-brain pathway, they are ready for the next step: learning how the brain can change. This is where the work of Nobel Prize–winning neuroscientist Dr. Eric Kandel becomes so important. Kandel's research on neuroplasticity shows that learning and repeated practice strengthen neural pathways and build new connections that connect to the Wizard Brain — the part of the brain responsible for planning, problem-solving, and self-control.

Teaching the five senses first gives children a concrete, relatable foundation: **“Here's how information gets into your brain.”** Then, with Kandel's research, BrainWise adds: **“Here's how learning and practicing the 10 Wise Ways strengthens the pathways you need to make wise decisions.”** Together, these two pieces of science help students understand not only *what* their brains do, but also *why* they must practice thinking skills to build the neural pathways that support wise decisions.

Emotions and Impulses. Sensory pathways highlight a critical biological reality: Our emotions trigger reactions. Because signals sent by our senses reach the Lizard Brain/limbic system first, we are born wired to react. This is why a touching a hot pot makes us pull our fingers back (helpful Lizard Brain) and why anger spurs us to push someone away or seek revenge (harmful Lizard Brain).

Developing strong pathways to the Wizard Brain trains children to assess whether a signal is coming from the *helpful* Lizard Brain or the *harmful* Lizard Brain . This allows the Wizard Brain (prefrontal cortex) to step in and ask, "*Is this a real emergency, or something I need to stop and think about before I react?*"

BrainWise in Action.

For the past 15 years, I have worked on BrainWise projects through Denver Mile High Rotary with students at Denver Public Schools' Career Education Center (CEC) High School. Many of their projects have been featured in past BrainWise newsletters, including students who were keynote speakers at a Rotary Zone meeting held in San Diego. The students presented on the thinking skills Taylor Swift used to handle a sexual assault she experienced in Denver and the trial of her perpetrator, ([see Issue #84](#)).

Most years, the projects have involved CEC teens – Rotary Interactors-- teaching and reinforcing the 10 Wise Ways with elementary school students. This has been done in person ([Issue #41](#), [Issue #67](#)) and virtually ([Issue #62](#), [Issue #98](#)). Because the children have learned the 10 Wise Ways in school, the teens can easily read with them and lead a range of reinforcement games and activities.



CEC Interactors Reading Pete the Cat

Teaching Skills for Life

In the [100th issue](#) of the BrainWise Newsletter, we recognized instructors with verified records of teaching the curriculum for 10–20 years. Using a conservative estimate of at least 20 students per year, these educators demonstrate an average reach of 289 students each. I personally know 18 instructors who have collectively taught more than 5,000 students.

These numbers reflect a fraction of the hundreds of thousands of children and youth who have benefited from BrainWise because of your sustained dedication.

I am profoundly grateful for your extraordinary commitment to educating and empowering them.



**My Best,
Dr. Pat**

On a Lighter Note

Pete the Cat

This year's CEC Interactors will be reading *Pete the Cat I Love My White Shoes*.^[1] The video below shows beloved Pete as he sings about his reaction to incidents that change the color of his beloved white shoes.

You can imagine how exciting it is for the Interactors to prompt children to use their BrainWise knowledge to explain Pete's responses.

[1] Pete the Cat books were created by James Dean. The video is hosted by Harper Collings, the Pete the Cat official channel.



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