



**Science Behind the Story (SBS)**  
**It's a SPECTacular Jungle Out There (🌍 A Brain Health Story)**  
**(4<sup>th</sup> Grade – 9-10 yrs)**

The world of a 4<sup>th</sup> grader is complex and has the potential to be frustrating and stressful. This is a time when children need to focus on taking care of their SPEC health, so that their brains can help them navigate through the challenges they are facing.

- 🌍 Understanding that we have a reciprocal relationship between our brain and our behaviors will help us to face these challenges to our SPEC health. We need to take care of our brain, so that our brain can take care of us.

Our brain allows us to do all the behaviors that we have to do to survive – eating, drinking, sleeping, thinking, learning, remembering, etc. We need our brain to do all the behaviors that we do and the behaviors that we do get the things that our brain needs to survive.

In neuroscience, it is well known that the interaction between the brain and behavior is reciprocal (Geng, 2021). The brain controls behavior and behaviors change the brain. The changes in the brain then allow our behaviors to change. Because the world we live in is always changing, our brain and behaviors are also always changing.

- 🌍 As a 4<sup>th</sup> grader you are facing lots of challenges to your SPEC health, it can be a virtual jungle out there.

Given that students are going to be facing challenges to their Social, Physical, Emotional and Cognitive (SPEC) health, it is important educate them on how to best deal with those challenges to promote a healthy brain.


Social Health gives students the tools necessary to handle challenges in their social lives. The development of the social brain throughout childhood and into adolescence results in a greater reliance on peer relationships than parental relationships (Andrews, 2021). The most important factor in social group membership is the ability to build a social identity or maintain a sense of self within a larger social group (Praharso, 2017). Emotional support provided by people in their support system were found to reduce the negative effects of peer victimization, bullying, and depressive symptoms during adolescence (Burke, 2016).

Our Physical Health depends on eating right and getting enough sleep. Our physical health also involves moving our bodies. Engaging in physical activity promotes anti-inflammatory mechanisms in the brain and encourages neuroplasticity and growth (Hosker, 2019). These mechanisms allow the brain to adapt to changing environments and be resilient in the face of stressors (Hosker, 2019). Moving our bodies is easy

to do, as there are so many ways to do it. Plus, encouraging physical activities that are enjoyable increases the likelihood that children will be motivated to continue being physically active throughout their life (Hosker, 2019).

Emotional Health depends on the ability to identify and control one's emotions (Villanueva, 2020). Teaching students these skills early on in childhood allows children to practice empathy at a young age (Tominey, 2017). The development of empathy will allow individuals to build strong and supportive relationships with their peers, which will increase their feelings of social support and resilience to stressors.

Cognitive Health gives students the tools they need to handle all kinds of intellectual challenges. An understanding of Bloom's Taxonomy of Learning instructs students to try to understand and use information that they are learning (Compton, 2019). Learning in this way also enhances neuroplasticity, or the brain's ability to change (Kays, 2012).

 Just like the animals in the jungle, we need to learn how to live in a world that is always changing. Focusing on SPEC health will allow how to survive and thrive our world.

Each person has a unique brain and is able to utilize the various components of brain health in a unique way that best suits them (Mueller, 2013). In the end, embracing individual differences in our brain function and our behaviors will allow us to reach our optimal brain health.

In order to minimize habits that result in poor brain health and encourage positive habits, it is important that the behavior is rewarding to each individual. If an individual performs an activity or engages in a routine that they enjoy because it satisfies their personal needs, they will be more likely maintain these habits going forward. This emphasizes the importance of "exercising" the different areas of brain health in a way that works best for the individual and satisfies their unique physical needs (Fiorella, 2020).

Encouraging young children to embrace the individual differences in their brains and their behaviors will empower them to optimize their brain health it a way that works best for them.

## **National Standards:**

### **Next Generation Science Standards**

- Crosscutting Concepts
  - **Stability & Change:** For both designed and natural systems, conditions that affect stability and factors that control rates of change are critical elements to consider and understand.
    - Change is measured in terms of differences over time and may occur at different rates.
    - Some systems appear stable, but over long periods of time will eventually change.
  - **Cause & Effect:** Events have causes, sometimes simple, sometimes multifaceted. Deciphering causal relationships, and the mechanisms by which they are mediated, is a major activity of science and engineering.
    - Cause and effect relationships are routinely identified, tested, and use to explain change.
    - Events that occur together with regularity might or might not be a cause & effect relationship.
  - **Patterns:** Observed patterns in nature guide organization and classification and prompt questions about relationships and causes underlying them.
    - Patterns of change can be used to make predictions.
    - Patterns can be used as evidence to support an explanation.
- Related Grade Level Content
  - **Structure, Function, and Information Processing**
    - 4-LS1-1: Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.

- 4-LS1-2: Use a model to describe that animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways between wave peaks). (4-PS4-1)

## **ASCA (American School Counselors Association):**

### **Academic Development**

- **Standard A:** Students will acquire the attitudes, knowledge and skills that contribute to effective learning in school and across the life span.
  - A:A1 Improve Academic Self-concept
    - A:A1.2 Display a positive interest in learning
  - A:A2 Acquire Skills for Improving Learning
    - A:A2.1 Apply time-management and task-management skills
    - A:A2.3 Use communications skills to know when and how to ask for help when needed
    - A:A2.4 Apply knowledge and learning styles to positively influence school performance
- **Standard B:** Students will complete school with the academic preparation essential to choose from a wide range of substantial post-secondary options, including college
  - A:B1 Improve Learning
    - A:B1.1 Demonstrate the motivation to achieve individual potential
    - A:B1.2 Learn and apply critical-thinking skills
    - A:B1.3 Apply the study skills necessary for academic success at each level
    - A:B1.4 Seek information and support from faculty, staff, family and peers
    - A:B1.5 Organize and apply academic information from a variety of sources
    - A:B1.6 Use knowledge of learning styles to positively influence school performance
    - A:B1.7 Become a self-directed and independent learner

### **Personal/Social Development**

- **Standard A:** Students will acquire the knowledge, attitudes and interpersonal skills to help them understand and respect self and others.
  - PS:A1 Acquire Self-knowledge
    - PS:A1.4 Understand change is a part of growth
    - PS:A1.6 Distinguish between appropriate and inappropriate behavior
    - PS:A1.8 Understand the need for self-control and how to practice it
    - PS:A1.10 Identify personal strengths and assets
    - PS:A1.11 Identify and discuss changing personal and social roles
- **Standard B:** Students will make decisions, set goals and take necessary action to achieve goals.
  - PS:B1 Self-knowledge Application
    - PS:B1.1 Use a decision-making and problem-solving model
    - PS:B1.2 Understand consequences of decisions and choices
    - PS:B1.3 Identify alternative solutions to a problem
    - PS:B1.4 Develop effective coping skills for dealing with problems
- **Standard C:** Students will understand safety and survival skills.
  - PS:C1 Acquire Personal Safety Skills
    - PS:C1.10 Learn techniques for managing stress and conflict
    - PS:C1.11 Learn coping skills for managing life events

## **National Health Education Standards (Shape America) & CDC (Centers for Disease Control and Prevention)**

- **Standard 1:** Students will comprehend concepts related to health promotion and disease prevention to enhance health.
  - 1.5.1: Describe the relationship between healthy behaviors and personal health. **(CDC)**
  - 1.5.2: Identify examples of emotional, intellectual, physical, and social health. **(CDC)**
- **Standard 5:** Students will demonstrate the ability to use decision-making skills to enhance health.
  - 5.5.1: Identify health-related situations that might require a thoughtful decision. **(CDC)**
  - 5.5.3: List healthy options to health-related issues or problems. **(CDC)**
  - 5.5.5: Choose a healthy option when making a decision. **(CDC)**

- 5.5.6: Describe the outcomes of a health-related decision. **(CDC)**
- **Standard 7:** Students will demonstrate the ability to practice health-enhancing behaviors and avoid or reduce health risks.
  - 7.5.1: Identify responsible personal health behaviors. **(CDC)**
  - 7.5.2: Demonstrate a variety of healthy practices and behaviors to maintain or improve personal health. **(CDC)**
  - 7.5.3: Demonstrate a variety of behaviors to avoid or reduce health risks. **(CDC)**

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