

Making Neuroscience Fun



A Brain Awareness Program for All Ages
It's SPECTacular!

Science Behind the Story What Do I Do? (🌈 A Social Health Story) (K – 4-5 yrs)

Children learn from watching others beginning from the time they are born. This story looks at social development and how children learn to trust themselves and others to make the right decisions.

- 🌈 There are a lot of choices to make in this world. Making good choices makes you feel good and that makes your brain happy and healthy. Making good choices means you first need to know what you know.

Individuals are presented with a number of choices every day. Beginning at birth, infants learn to imitate others around them (Carlson, 2007) and attend to stimuli that others around them focus on (Meltzoff, 2009).

Prior to choosing, children must be able to access information that is stored in their brain (Blakemore, 2012). The parts of the brain that are involved in making choices involve the prefrontal and parietal cortex do not fully develop until a person reaches the end of adolescents (between 25-30 years old) (Hartley, 2015)

The ability to make a decision also involves predicting where and when rewards occur based on choices (Diekhof, 2008). So, making choices, especially good choices, activates our reward pathway and makes us “feel” good.

- 🌈 When you do not have all the information to make the right choice, you need to know who to ask for help.

Children use multiple sources of information when they are learning about the world (Hermansen, 2021). Asking others for information is a common source of information (Bridgers, 2018; Kilday, 2022).

- 🌈 Making good choices will help you feel good about yourself and makes your brain happy and healthy.

Behaviors that are important for the survival of the species are behaviors that we want to occur – such as eating, drinking, sleeping, sex (Barrett, 2018).

These behaviors help us to get primary reinforcers, food, water, etc., and activate the reward pathway (Dutcher, 2018) – also known as our pleasure center. These behaviors – make us happy – and so we tend to do them when the need arises...think about how good a glass of water looks when you are thirsty.

When making good choices, the reward pathway is activated (Hikosaka, 2018).

National Standards:

Next Generation Science Standards

- Crosscutting Concepts:

- **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.
 - Events have causes that generate observable patterns.

ASCA (American School Counselors Association):

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:A1.1 Develop positive attitudes toward self as a unique and worthy person
 - PS:A1.2 Identify values, attitudes and beliefs
 - PS:A1.6 Distinguish between appropriate and inappropriate behavior
 - PS:A1.7 Recognize personal boundaries, rights and privacy needs
 - PS:A1.8 Understand the need for self-control and how to practice it
- **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

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.
 - 1.2.1: Identify that healthy behaviors impact personal health. **(CDC)**
- **Standard 5:** Students will demonstrate the ability to use decision-making skills to enhance health.

References:

Barrett, L. F., & Finlay, B. L. (2018). Concepts, goals and the control of survival-related behaviors. *Current opinion in behavioral sciences*, 24, 172-179.

Blakemore, S. J., & Robbins, T. W. (2012). Decision-making in the adolescent brain. *Nature neuroscience*, 15(9), 1184-1191.

Bridgers, S., Gweon, H., Bretzke, M., & Ruggeri, A. (2018). How you learned matters: The process by which others learn informs young children's decisions about whom to ask for help. In *CogSci*.

Carlson, N. R., & Carlson, N. R. (2007). *Physiology of behavior*.

Diekhof, E. K., Falkai, P., & Gruber, O. (2008). Functional neuroimaging of reward processing and decision-making: a review of aberrant motivational and affective processing in addiction and mood disorders. *Brain research reviews*, 59(1), 164-184.

Dutcher, J. M., & Creswell, J. D. (2018). The role of brain reward pathways in stress resilience and health. *Neuroscience & Biobehavioral Reviews*, 95, 559-567.

Hartley, C. A., & Somerville, L. H. (2015). The neuroscience of adolescent decision-making. *Current opinion in behavioral sciences*, 5, 108-115.

Hermansen, T. K., Ronfard, S., Harris, P. L., & Zambrana, I. M. (2021). Preschool children rarely seek empirical data that could help them complete a task when observation and testimony conflict. *Child Development*, 92(6), 2546-2562.

Hikosaka, O., Ghazizadeh, A., Griggs, W., & Amita, H. (2018). Parallel basal ganglia circuits for decision making. *Journal of Neural Transmission*, 125(3), 515-529.

Kilday, J. E., & Ryan, A. M. (2022). Who Do Students Ask for Help With Classwork? Sources of Help and Changes in Help-Seeking From Peers During Early Adolescence. *The Journal of Early Adolescence*, 02724316221124784.

Meltzoff, A. N., Kuhl, P. K., Movellan, J., & Sejnowski, T. J. (2009). Foundations for a new science of learning. *Science*, 325(5938), 284-288.