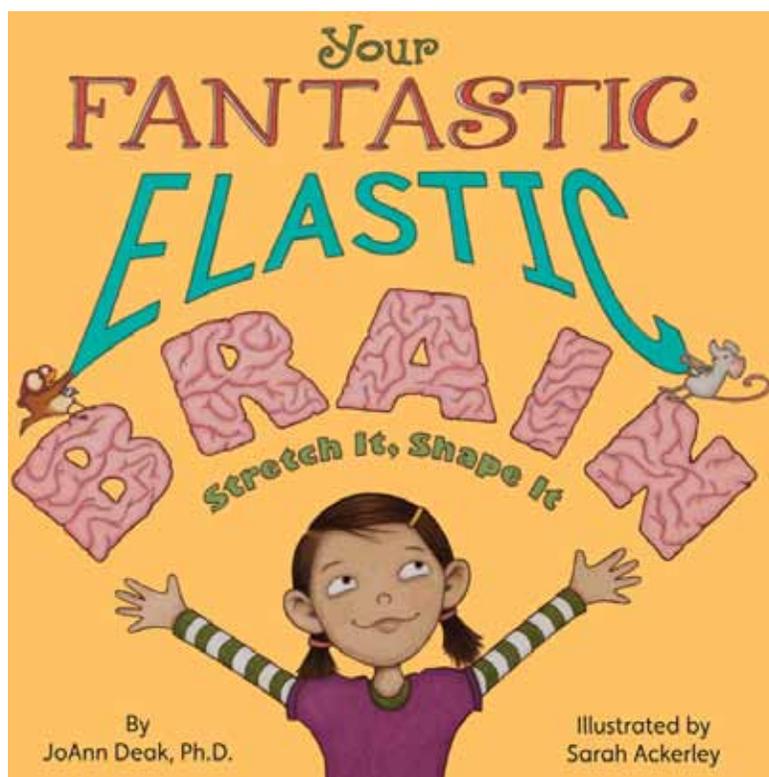


# Little Pickle Press



## Lesson Plans for Teachers Kindergarten - Grade 3

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# Overview

In *Your Fantastic Elastic Brain*, author JoAnn Deak, Ph.D. introduces children to the wonders of their own brains. Through lively text and colorfully illustrated diagrams, children come to understand the integral role they play in stretching and shaping this powerful organ.

Dr. Deak builds her text on a series of scientific principles identifying the critical importance of brain development in early childhood. Specifically, the first 10 years of life constitute a magic decade. Key neural connections must be established during this early developmental window or they are unlikely to develop later. In essence, when it comes to our brain, we have to “use it or lose it.” The brain requires its most extensive stretching and shaping during this early sensitive period, as comparable efforts in later years provide diminishing returns relative to the amount of effort exerted.

*Your Fantastic Elastic Brain* depicts numerous phenomena relevant to developing children’s rich understanding of their most powerful resource, specifically:

- a comprehensive description of the brain and its diverse functions;
- a detailed neuroanatomy of primary brain regions;
- key principles of brain growth and neuroplasticity;
- the role of individual agency in contributing to brain growth.

The text provides an entry point for teachers to introduce children to the habits of mind and action that support healthy brain growth. *Your Fantastic Elastic Brain* promotes several essential messages, namely: what children do on a daily basis affects the growth of their brains; brains require exercise and struggling to develop new skills contributes to brain growth; making mistakes is a positive experience that contributes to healthy brain growth.

Classroom activities in this instructional unit encourage children to reflect upon their experiences as individuals, particularly those related to personal success and areas for growth. The instructional activities also enable teachers to cultivate children’s character development through the pillars of courage, reasoning, and responsibility.

This unit includes three activity sets as well as supplemental online resources to augment the more straightforward projects. The activity sets are designed to be taught in sequence, such that knowledge acquired in the first set of activities can be applied in subsequent sets. Teachers can build and embellish the activities to best suit their classroom needs.

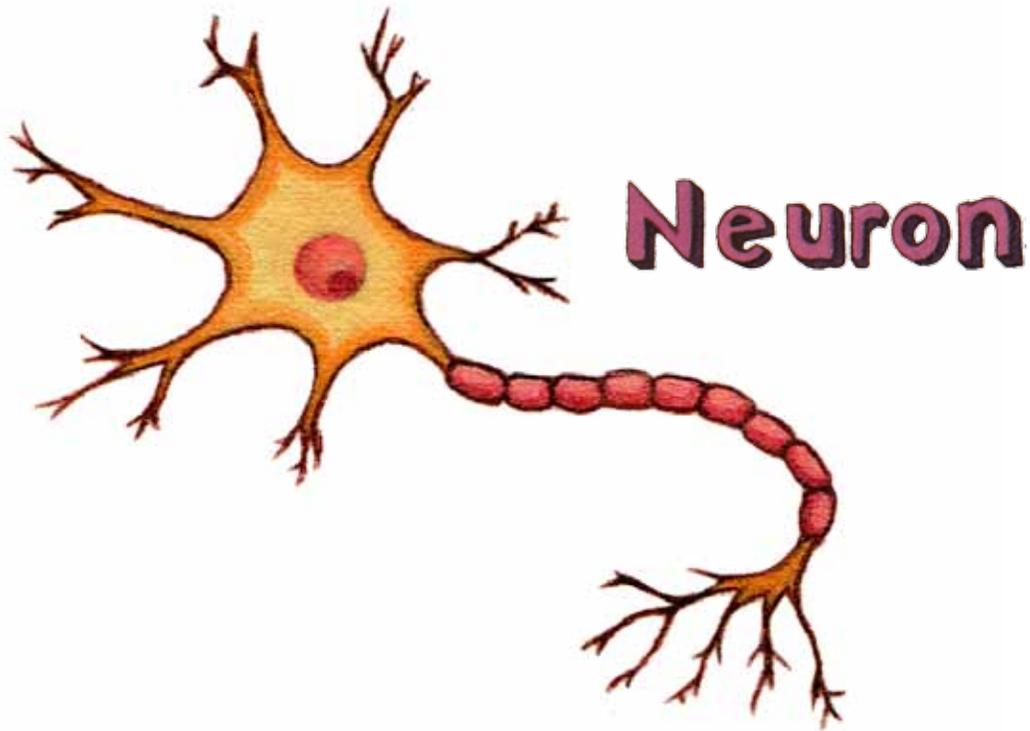
At each grade level, the lessons align with the Common Core State Standards Initiative for Speaking and Listening (<http://bit.ly/corecurriculumstandards>). The Common Core was recently adopted by the majority of states and is especially pertinent for educators in the United States.

*Your Fantastic Elastic Brain* is a picture book printed on recycled materials using soy inks and is an excellent addition to every school library. Please visit the links at the end of the lesson plans to see all of our products.



# Activity Set 1

## What Is a Brain and What Does It Do?



### Background

The brain is the most important organ in our body. It influences our actions, thoughts, and feelings – essentially everything we do! The average human has 100 billion brain cells, called neurons. Although our brain continues to grow after birth, the majority of these neurons are present when we are born. However, many of the important connections among these neurons occur after birth. An average child's brain weighs about two pounds, whereas the average adult brain weighs about three pounds, 75% of which is water. The brain is lateralized, which means that the left hemisphere controls the right side of our body, and the right hemisphere controls the left side of our body. One of the most unique features of a brain is its plasticity, which means that the brain continues to grow and change based on daily life experiences.

### Objectives

- Students will develop a basic understanding of the neuroanatomy of the brain.
- Students will develop an awareness of the brain's primary functions.
- Students will develop an understanding of the concept of neuroplasticity.

## Focal Activity

### Guiding Questions:

- What is a brain?
- Where is your brain?
- How big is your brain?
- What does your brain look like?
- Are all brains the same?
- Why do we have a brain?
- What does your brain do?
- Do all living creatures have a brain?
- How do you think our brain is different from that of animals?

### Activity A Learning about the Brain's Form

Start a brain journal for each student. All of the activities in this unit can be compiled within the brain journal. Provide students with a blank map of the brain (See Appendix A). Explain that each part of the brain has a special name. Highlight the five key brain regions (cerebrum, cerebellum, prefrontal cortex, hippocampus, and amygdala) depicted in *Your Fantastic Elastic Brain*. Younger students can color corresponding regions of the brain; older students can label their maps with words that they write themselves (or glue on corresponding labels that you have prepared ahead of time).

### Activity B Learning about the Brain's Function

Revisit the brain maps used in Activity A (or provide students with a new blank map). Talk to students about the functions of these key brain regions. Encourage students to provide familiar real-world examples of each of these functions. Next, ask students to draw or write about these functions on the corresponding regions of their brain maps.

As an extension, provide students with materials to create brain flash cards. One side of the card could depict the name of the brain region and a corresponding picture highlighting that region. The reverse side of the card could depict (pictorially and/or with words) the corresponding function of that region.

### Activity C Learning about the Brain's Function

Present students with a grapefruit-sized ball of rubber bands. Explain that the rubber band ball is similar to the brain in both size and consistency. The brain is made up of rubber band-like structures, both large and small. Each of us was born with large and small rubber bands, cor-



responding to areas in which we are skillful and areas where we can grow. Model how rubber bands can stretch, and explain that this stretching is symbolic of brain growth. Provide students with a set of large and small rubber bands and allow them to practice stretching them as they visualize their brains growing. Which type of rubber band is easier to stretch? Which requires more effort? Reiterate the idea that our brains can grow and stretch with practice.

To further reinforce the concept of brain malleability and plasticity, provide each student with a ball of clay and encourage them to stretch and mold it into the shape of their own brain.

## Character Building Connections

The key character value to cultivate in this lesson is reasoning. Children can be encouraged to wonder and think critically about their brains:

- How is my brain organized?
- How does my brain solve problems and make decisions?
- Which areas of my brain are used for problem solving and decision-making?
- What is my brain's capacity for memory?
- How can my brain continue to develop skills for learning?

## Additional Online Resources

Your Brain and Nervous System: <http://bit.ly/brainnervoussystem>

Brain Form and Function: <http://bit.ly/brainfunction>

Human Brain Facts for Kids: <http://bit.ly/brainfactsforkids>

Neuroscience for Kids: <http://bit.ly/neurosciencekids>

100 Brain Facts: <http://bit.ly/100BrainFacts>



# Activity Set 2

## How Is My Brain Unique?



### Background

Each of us is born with unique strengths. Some of us are stellar athletes who can run as fast as the wind; some of us are phenomenal writers who always know just the right word to use; some of us have huge hearts and make friends easily. Each of these strengths relates to an area of our brain. If a particular skill comes easily for us, the corresponding part of our brain is already in shape. Our brains require exercise to stay in shape. Some of the skills that we are good at require less brain exercise while those that we want to improve will require more brain exercise. Now for the good news! We can strengthen our brain and learn to do new things through effort and practice. And the even better news – making mistakes is an important part of this process. When you make a mistake, your brain learns to identify what didn't work quite right so that it can try a different strategy the next time around. The anterior cingulate cortex, also known as the "mistake filter" in our brain, is only activated when a mistake is made. Thus, trying out new strategies ultimately leads to skill improvement and brain growth.

### Objectives

- Students will identify areas of personal strength, and connect these skills to corresponding regions of the brain.
- Students will identify areas for personal growth and connect these skills to corresponding regions of the brain.
- Students will develop an understanding of how mistakes function as a learning tool that helps the brain grow.

## Focal Activity

Guiding Questions:

- What are some things that you are good at doing?
- Were you always good at this activity or did you have to practice?
- Are there people in your family with similar skills?
- What are some things that you would like to become better at doing?
- How do you think you might improve your skills?
- Have you ever made a mistake?
- How did it feel when you made the mistake?
- What happened after you made the mistake?

### Activity A What Are My Brain's Strengths?

Re-introduce the small and large rubber bands from Activity C in Activity Set #1. Remind students that we are all born with large and small rubber bands, corresponding to our existing skills and capacity for growth, respectively. Provide each student with several large rubber bands and encourage them to think across domains (e.g. kinesthetic, social/emotional, cognitive, natural, musical, etc.) about which unique skills these rubber bands represent for them as individuals. Invite students to draw or list these skills in their brain journals. Next, ask students to refer to the interactive brain maps created in Activity Set #1 and find which skills these large rubber bands represent in their lives. Students can attach the large rubber bands to the brain regions on their brain maps corresponding to their areas of strength.

### Activity B Which Areas of My Brain Do I Want to Develop?

Now provide each student with a set of several small rubber bands and again encourage them to think across domains (i.e. kinesthetic, social/emotional, cognitive, natural, musical, etc.) about skills that they would like to improve. Again, invite students to draw or list these skills in their brain journals and then refer to their interactive brain maps. Invite students to attach the small rubber bands to the brain regions on their brain maps corresponding to desired areas of skill improvement.

Following Activities A and B, lead students in a discussion about the diverse collection of unique strengths and areas of development within the class. This discussion can be used to segue into an explanation of how each person has a unique learning style, complete with strengths (large rubber bands that need less stretching) and areas for development (small rubber bands that require greater stretching).



## Activity C

### Mistakes Are My Friend!

Encourage students to reflect on some “mistakes” they may have made recently. These mistakes could be shared and charted in a class discussion or recorded (in pictures or words) in students’ brain journals. Invite students to share what they learned or what they did differently following these mistakes. Ask students to think about which part of their brains may have actually grown as a result of the learning that took place after the mistakes. Students can refer to their personal brain maps and add details about their mistakes and subsequent brain growth.

As an extension, invite a local hero (principal, art teacher, room parent, mayor, fire fighter, etc.) to share his or her own positive learning experiences as a result of early “mistakes.” Encourage these heroes to highlight how they continue to stretch and shape their brains, even as they make mistakes as adults.

### Character Building Connections

The key character value to cultivate in this lesson is courage. Children can be encouraged to think about developing personal strength as they actively engage in processes of self-discovery and brain growth:

- What risks am I comfortable taking while still maintaining personal safety?
- What can I learn from my mistakes?
- What goals can I set for myself?
- How can I be sensitive to both my needs and those of others as we work toward strengthening our brains?
- How can I remain patient with myself as I make mistakes that contribute to my brain’s growth?
- How can I best handle unfamiliar new experiences?

### Additional Online Resources

Brain Education Resources: <http://www.deakgroup.com/>

Teaching Kids about the Brain and Nervous System: <http://bit.ly/teachingnervoussystem>

Neuroscience for Kids: <http://bit.ly/neuroscienceforkids>



# Activity Set 3

## How Can I Help My Brain Grow?



### Background

What we do affects the growth of our brain. Struggling with certain skills helps our brains change and grow. If we stick to only doing what comes naturally or easily, our brains won't grow. To promote successful brain growth, we have to defy our natural inclination to back away from things that strike us as too difficult and rather, increase the time we spend developing skills that may not come naturally. We also need to provide our brains with the opportunity to develop new skills through different mediums (e.g. listening, building, speaking, creating, writing, moving, etc.). Each of us is a neurosculptor! Like a fabulous artist creating an original design, we are actively responsible for creating the design of our own brain. There is no one way to design a brain either. We can develop our brains in numerous realms – social/emotional, cognitive, physical, musical, theatrical, environmental, the list goes on and on! What matters most is that we define which areas of brain growth are most important to us, and then take the necessary steps to make it happen. Young children are fortuitous when it comes to taking charge of brain growth as the possibilities for developing new skills are nearly limitless.

### Objectives

- Students will develop an understanding of the importance of individual effort and agency in contributing to brain growth.
- Students will learn that individual effort and practice can contribute to positive personal development in numerous realms, including social/emotional, cognitive, and physical/kinesthetic growth.
- Students will be able to identify specific actions and practices they can undertake to facilitate their brain growth.

## Focal Activity

### Guiding Questions:

- What things am I really good at doing?
  - What things do I want to be really good at doing?
  - Who do I know that is really good at something social or emotional (might phrase as “helping or being kind to others”)?
  - Who do I know that is really good at something cognitive (might phrase as “in school” or “thinking”)?
  - Who do I know that is really good at something physical or kinesthetic (might phrase as “at a sport” or “doing something with their hands”)?
- \*Note: These questions can certainly be extended to include other skill areas (i.e. musical, environmental, theatrical, culinary, etc.) as well.
- What has/have that person/these people done to become really good at that skill?
  - What can I do to become better at the things I want to be really good at doing?

## Activity A

### Growing a Social/Emotional Brain

Talk to students about the importance of stretching the social and emotional regions of their brains. Building these social and emotional areas can help build confidence in interpersonal interactions. For example, when we work with different groups of people, we become more skillful at communication and understanding others. As a class, brainstorm social and emotional skills that students possess or can develop (e.g. kindness to others, leadership skills, being a good listener, working as a member of a team, taking care of pets or younger siblings, etc.). Connect these skills to the brain regions that students have been studying in this unit. Encourage each student to identify a personal area of social or emotional strength, as well as an area for growth. Ask students to identify specific steps they can take to maintain the area(s) of strength and build area(s) of growth.

Provide each student with a “brain growth tracker” (see Appendix B) to keep in their brain journals. Invite students to record (with pictures or words) the actions they take daily or weekly to build their targeted area of social/emotional growth. Provide an opportunity for a daily/weekly “brain break” where students can check in with the group to share and receive peer and teacher feedback about how they are building their social/emotional skills. Encourage students to share the feelings they encountered (i.e. confidence, empowerment) during this practice. If students feel comfortable, ask them to share about any mistakes they may have made during this brain growth process and how these mistakes influenced their feelings and actions.



## Activity B

### Growing a Cognitive Brain

Activity B parallels Activity A though the emphasis shifts now to the importance of stretching the cognitive and academic regions of the brain. Building cognitive regions of the brain can help build students' confidence and success with academic endeavors. As a class, brainstorm cognitive skills that students possess or can develop (e.g. solving puzzles, expanding vocabulary, organizing ideas or materials, using technology effectively, etc.). Connect these skills to the brain regions that students have been studying in this unit. Encourage each student to identify a personal area of cognitive or academic strength, as well as an area for growth. Ask students to identify specific steps they can take to maintain area(s) of strength and build area(s) of growth.

Invite students to record these areas of cognitive/academic strength and growth on a new page or section of their brain growth tracker. Again, provide students with opportunities to share and receive peer and teacher feedback.

## Activity C

### Growing a Physical/Kinesthetic Brain

Activity C also parallels Activity A though the emphasis shifts now to the importance of stretching the physical and kinesthetic regions of the brain. Building physical or kinesthetic regions of the brain can help build students' confidence with their bodies and the mind-body connection. As a class, brainstorm physical/kinesthetic skills that students possess or can develop (i.e. playing an instrument, being proficient at a sport, baking a special family recipe, learning to dance, etc.). Connect these skills to the brain regions that students have been studying in this unit. Encourage each student to identify a personal area of physical or kinesthetic strength, as well as an area for growth. Ask students to identify specific steps they can take to maintain area(s) of strength and build area(s) of growth.

Invite students to record these areas of physical/kinesthetic strength and growth on a new page or section of their brain growth tracker. Again, provide students with opportunities to share and receive peer and teacher feedback.

## Character Building Connections

The key character value to cultivate in this lesson is responsibility. Children can be encouraged to think carefully about positive decision-making and perseverance in the pursuit of successful brain growth:

- What steps can I take daily to follow through with the goals I have set for myself?
- What can I do if I feel frustrated by my mistakes and want to give up?
- Who can I turn to for help when I need assistance or guidance with a new skill or activity that I am developing?
- How can I show respect to both myself and others as we take steps to grow our brains?



## Additional Online Resources

Brain Exercises for Children: <http://bit.ly/brainexercises>

Exercise Your Brain: <http://bit.ly/exerciseyourbrain>

Brain Games for Kids:

- <http://bit.ly/funbraingame>
- <http://bit.ly/braingameskids>
- <http://bit.ly/lightbraingame>



# Little Pickle Press Resources

This concludes our lesson plan for *Your Fantastic Elastic Brain*. If you have comments, questions, or other ideas please share them with us at the special blog link we have created:

<http://bit.ly/bloglessonplans>

Additional lesson plans are available for other titles in our collection, so please check the resource link at our webpage often:

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- 2011 Nautilus Book Silver Award Children's Non-Fiction
- 2011 Benjamin Franklin Silver Award: Interior Design, Children's/Young Adult
- 2011 Next Generation Indie Award Finalist Children's/Juvenile Non-Fiction
- 2011 Parents' Choice Recommended Award Children's Non-Fiction

To find the book elsewhere, please use this information:

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# Brain Map

