



**The Brain Changes All the Time ( A Brain Facts Story)**  
**(5<sup>th</sup> Grade – 10-11 yrs.)**  
**Demonstration/Video: Connecting the Dots**



**STORY CONNECTION – SLIDES 14-15 (Approx Time: 15-20 min)**

In some cases, a brain change will mean that there is a change in the number of actual cells you have in your brain. The human brain is made up of billions of cells – neurons and the glial cells. Your brain is constantly making new cells and getting rid of cells depending on the behaviors that you are doing. We know that when you have more cells working to produce a behavior – your brain is working harder and using more energy. When you are using less cells to do the same behavior, then you are using less energy. That is why when you do some behaviors, like learning to do something new – like shooting a basketball into a hoop - the brain starts out using more cells to do this behavior when you are first learning. When you get good at putting the basketball in the hoop, you are using less cells. Practice makes perfect and makes your brain more energy efficient, and it makes your ball go in the hoop more ---- Practice makes perfect and makes your brain more efficient!!! In some cases, a brain change will mean that the way the cells in the brain work is changed. Neurons are constantly talking to other cells – other neurons, glial cells, muscle cells, organ cells. There are lots of ways the communication between cells in the brain changes.

**Materials needed:**

- Video Clip #1: 2-Minute Neuroscience: The Neuron
  - <https://www.youtube.com/watch?v=6qS83wD29PY> (1:47)
- Video Clip #2: 2-Minute Neuroscience: Glial Cells
  - [https://www.youtube.com/watch?v=AwES6R1\\_9PM](https://www.youtube.com/watch?v=AwES6R1_9PM) (2:00)
- Paper
- Pencils
- Colored pencils, markers, crayons (10 different colors/shades)
- Glial cells picture (included below) or link:
  - <https://www.lcboe.net/userfiles/1163/Classes/33035/glial-cells-labeled.png?id=555269>
- Additional information for facilitators (optional):
  - <https://faculty.washington.edu/chudler/glia.html>

**Preparation needed:**

- Preview videos prior to activity.
- Determine what information is helpful for your student(s) from the website to clarify and explain more:
  - <https://faculty.washington.edu/chudler/glia.htm>
- Materials readily available to do step-by-step dot connections with student(s)

## Instructions:

1. In this activity, the student(s) will learn more about neurons and glial cells. This might be a difficult and/or abstract concept for some student(s) to wrap their brains around. It might be a good idea to reassure them that if this material is not 100% clear that it is okay. Between the videos, picture, and dot activity, they will add to their knowledge of this abstract concept.
2. Review the information from slides 14-15 from the story and the images from the PowerPoint presentation.
3. Show video Clip #1: 2-Minute Neuroscience: The Neuron. Watch it in its entirety.
4. Discuss and clarify the video as needed.
5. Show video Clip #2: 2-Minute Neuroscience: Glial Cells. Watch it in its entirety.
6. Discuss and clarify the video as needed.
7. Show the glial cells picture (link or image included below) and help further explain the glial cells if there are questions or interest. In simple language, the glial cells do the following:
  - They are “supporting cells”
  - Hold neurons in place
  - Supply nutrients and oxygen to the neurons
  - Insulate one neuron from another
  - Destroy and remove waste from neurons
8. Next, to help the student(s) better understand just how complex these connections in the brain are, have them do the following:
  - Draw 10 dots down one side of a piece of paper.
  - Draw 10 dots down the other side of a piece of paper directly across from the first set of dots.
  - The dots will represent the neurons.
  - Next, connect each dot on one side with all 10 dots on the other side. Use a different color when starting from a new dot on the left. See the example below.
  - Continue until all dots on the left are connected to all dots on the right.
9. The student(s) should see that this will get extremely complicated after a while.
10. Remind student(s) that this demonstration is very simplified compared with the thousands and thousands of connections that neurons really make within our brains. Hopefully, this gives them a better understanding of just how much activity is happening between neurons and with the aid of glial cells.
11. In closing, remind student(s) that neurons are constantly talking to other cells – other neurons, glial cells, muscle cells, organ cells. There are lots of ways the communication between cells in the brain changes. All these changes in the brain allow us to adapt to and survive in our environment. Adaptation and survival are good for the body and the brain.

Image and Activity Idea Credit:

<https://faculty.washington.edu/chudler/chmodel.html#:~:text=Draw%2010%20dots%20on%20one,dots%20on%20the%20other%20side.>



