

THE TEENAGE BRAIN IN SEARCH OF ITSELF

Webquest “Answers” Sheet

Name _____

Date _____ Class _____

Answer the questions in full sentences. Underlining the key word in the sentence will help you later if you use this document as a study guide.

Section A. The Big Picture: A look at your brain and its parts

1a. How many parts make up the central nervous system?

2a. How much does an adult brain weigh?

3a. How many nerve cells are there in the brain?

4a. Are there any other special cells in the brain?

5a. What are they?

Section B. Close Up Picture: The neuron and neurotransmitters

1b. What is a neuron?

2b. What does it do?

3b. About how many neurons are there in the human brain?

4b. Are neurons the only kind of cell in the brain?

5b. Give an example of another cell in the brain and what it does.

6b. Do all neurons look the same?

7b. Generally, there are three types of neurons. What are they and what do they do?

8b. According to this site, how many molecules meet the criteria for being a neurotransmitter?

Section C. Getting the Picture: Technology used to “see” the brain

1c. List five technologies used to scan the brain. Include their acronyms. (Sentences are not required for this answer.)

1.

2.

3.

4.

5.

2c. Who was the first person to use this kind of technology?

3c. Where and when did he do this?

4c. Are images of the brain “seen” with this technology?

5c. What are researchers actually observing?

6c. What is the disadvantage of using this method for observing the brain?

7c. When was this technology developed?

8c. This technology creates 3 –dimensional images from what kind of 2-dimensional imaging technology?

9c. What can CAT scans detect?

10c. When was this technology developed?

11c. What advantage does this technology have over earlier technique for observing the brain?

12c. What element in the body is affected by the magnets in the MRI machine?

13c. After the atoms return to their natural alignment having released their energy, what instrument is used to produce the image?

14c. What advantage does the MRI scan have over the Pet scan for the subject?

15c. What does MEG detect from the brain?

16c. What is the name of the sensitive instrument that detects the brain's magnetic field?

17c. Although expensive and heavy, what can it do that makes it an important brain scanning method?

Section D. How is your brain changing?

1d. What do scientists mean by the principle of "use-it-or-lose-it" when talking about how neurons connect?

2d. What is gray matter?

- 3d. What is a possible explanation for increased growth of gray matter in early puberty (age 11 to 12)?
- 4d. What technology is used by neuroscientists to observe the growth and pruning in the teenage brain?
- 5d. Gray matter wanes (lessens) in which direction as the brain is pruned, back to front, or front to back?

Section E. Where in your brain are the changes happening?

- 1e. Which parts (lobes) of the brain begin these changes first?
- 2e. Can you name a function in that area that would be affected?
- 3e. Which region of the brain changes last?

4e. Identify three functions of the prefrontal cortex.

5e. Identify three functions that improve as the teenage brain matures.

6e. Why is pruning synapses and losing gray matter important for brain development?

Section F. What might these changes mean in terms of how you think, learn, and your behavior?

*This is a bonus question. Your answer must be in paragraph form, at least three paragraphs long. Using any of the information you have learned in this quest, answer one of the questions from the "Introduction".

Bonus Question Answer Sheet:

END OF "ANSWERS"