

**Multnomah Education Service District  
School Health Services  
Mental Health Curriculum Manual**

**Title: The Mental Health Curriculum for School Age Children, Ages 10 to 12**

**Module 2: THE BRAIN CONNECTION in MENTAL HEALTH**

**Module 2 Overview:** This module focuses on the brain connection with mental health and illness, and how various parts of the brain interact and play a role in emotions and behavior. The functions of various parts of the brain are described and students learn to recognize the thinking, feeling, and doing parts of their brains and how these parts evolve. The mechanisms of communication within the brain and the body are explored, and include discussion of sensory nerves and pathways, neurons, synapses, and the electrical and chemical messengers that carry information over the synapses, from one neuron to the next. A basic understanding of how the brain works provides a foundation for talking about things that can go wrong in the brain, and how injuries to the brain can cause changes in someone's emotions, thinking, and behavior. Brain injuries and protecting the brain from injury are emphasized, along with safety precautions such as wearing a helmet when bicycling or roller blading. Brain fitness is also discussed. Students learn that the genes they are born with can affect their mental health, but genes alone won't necessarily make someone mentally ill. Other factors in the environment, the stressors we experience, as well as life events and various situations can increase the risk for mental illness.

**Module Objectives:** After completing this module, students will be able to:

**Knowledge Domain:**

1. Describe how the brain is related to thinking, emotions, and behavior.
2. Identify how the brain grows and develops over different ages.
3. Relate basic functions of various parts of the brain.
4. Describe how the parts of a brain communicate with cells called neurons.
5. Give examples of chemicals in the brain.
6. Give examples of what can go wrong in the brain that affects emotions and behaviors, such as occur with brain injuries.
7. Identify ways to protect the brain and practice good brain fitness.
8. Identify the role of genes and what we are born with in risk for mental illness.
9. Discuss environmental factors and situational factors that increase the risk for mental illness.

**Affective Domain:**

1. Appreciate the importance of the brain.
2. Appreciate ways to protect the brain from injury and take care of their brains.
3. Experience curiosity about how their brains are linked to emotions, behavior, and mental health.

**Talking Points/ Outline for Module 2:**

- What this class is about: How the brain is connected to your behavior, your emotions, and your mental health.

- What the brain looks like and how it grows from the time you're born to adulthood. Did you know that by the age of 6 your brain has achieved 90% of its size?
- How the brain works like a computer; it's the central control for all your body systems. What are the things you couldn't do if you didn't have a brain? You can't cut your body off at the neck – what would happen?
- Your feelings are controlled by the brain. Are your emotions really in your heart? Is your heart really broken when you are sad, or is it coming from the feeling part of the brain?
- The brain isn't just for thinking: You have a thinking brain, a feeling brain, a survival brain, and a motor brain. Really you have 3 brains layered into one, and a motor brain attached. They evolved over millions of years and nest one inside the other with the thinking brain in the last layer at the top of the brain. The 3 parts of the brain are wired together, and they are constantly communicating with each other to form a thinking-feeling-doing network. The messages between the parts of the brain, and between the body and the brain, are carried by the nerves. What your skin senses, your eyes see, and your ears hear can trigger messages from your body to the feeling and thinking parts of your brain.
- The “switching” function of the brain sorts out where to send the messages from the nerves, and assigns an emotion even before the brain thinks about it. If you touch a hot stove or see a scary site, your peripheral sensory nerves send messages to the spinal cord, which takes the messages to the thalamus where a sensation is assigned and you react, even before you think. It's like a reflex. Emotional reactions happen like this too; Sometimes you feel an emotion before you think about what happened to make you feel that way; you feel the emotion before your thinking brain understands the emotion. This is what happens in your brain when get really mad or really scared. (Treays, 1996; Rowan, 1998, p. 28-29; [www.eqtoday.com](http://www.eqtoday.com) – Hijacking the Amygdala).
- Parts of the brain work together and other parts work independently. If you are feeling bored, how does it affect the ability of your thinking brain to concentrate on what you're supposed to learn in class?
- Brain communication: Neurons, synapses, talking through neurotransmitters (mild electrical impulses and chemicals carry the message over the gaps between the neurons)
- These days the brain is often compared to a computer. How are brains and computers alike? (Chudler, 2005)
- Chemicals and how they affect your brain and behavior: Tryptophan in turkey makes you sleepy, chocolate, runners high – endorphins, Things can go wrong in the brain, just like in other parts of the body. What does it mean when people talk about mental illness as a “chemical imbalance”?
- The Adolescent Brain – How the brain grows and changes from childhood to adulthood. You are born with most of the neurons your brain will ever have, about 100 billion. During ages 1-3 your brain grows really fast and triples in weight. The brain begins to create pathways between neurons so

things become easier and you can do remember to do them. Teens process emotions differently than adults and the brain goes through major changes during the young adolescent years (Giedd, J. NIMH, Retrieved from the World Wide Web in April 2005 at

<http://www.pbs.org/wgbh/pages/frontline/shows/teenbrain/work/onereason.html>

<http://www.pbs.org/wgbh/pages/frontline/shows/teenbrain/work/adolescent.html>

- Genes affect the brains connections and how the brain works; genes are things you get from your parents, we can't choose our genes.
- Genes give us unique characteristics, like blue eyes or brown hair, or the ability to sing well or dunk a basketball.
- Genes also determine what we will inherit as risks for mental illness. Almost all families have someone with symptoms of mental illness, so many of us will have genes that give us a risk for a mental illness, but we don't necessarily get a disorder.
- Other things that determine mental health or risk for mental illness: stress, specific events like violence or traumas, exposure to natural disasters, environmental factors and exposures to toxic substances, drugs and alcohol, accidents, experiences in childhood or adulthood, poverty, rejection, culture.
- The care and feeding of the brain. **Protection:** head protection in sports, seat belts in the car, knowing how deep the water is where you dive, 8 hours of sleep a night to restore the brain and keep it functioning properly, and exercising to promote new brain cell growth, memory and retention of what you learn, laughing, and avoiding drugs and alcohol – damages the teenage brain in ways that it doesn't as an adult. **Feeding:** Water – brain works best when hydrated, Omega 3 Fatty Acids, Blueberries and antioxidants, Chocolate.

**Parent Letter: (Example attached)**

**Teacher Letter: (Example attached)**

**In-Class Overheads:**

OH #1: The Garfield Brain Cartoon (Cats and Brains)  
Source: Jim Davis (2002), Universal Press Syndicate, [www.garfield.com](http://www.garfield.com)

OH #2: Fist and Arms Representing the Nervous System  
Source: NOVA website, Retrieved May 2005 from [www.pbs.org/wgbh/nova/coma/geography/photos.html](http://www.pbs.org/wgbh/nova/coma/geography/photos.html).

- OH#3 - #4: What Causes MH Problems: Genetics, Environment, Biology, & Things that Happen  
Source: Stember, L., Schrinisky, J., & Barnett, 2000
- OH #5: Figure of the Brain #1: Brain Parts – Cortex, Corpus Callosum, Thalamus, Cerebellum, Pons, and Spinal Cord  
Source: Treays, R. (1995). Understanding your Brain: Usborne Science for Beginners. Tulsa, OK: EDC Publishing. ISBN 0746020147
- OH #6: Cartoon: How the Brain Works (Electrician with plugs)  
Source: Jerry VanAmerongen, The Neighborhood, King Features Syndicate, Inc.
- OH #7: The Brain Map (colored brain regions)  
Source: 3D Science.com
- OH#8: Figure of the Brain #3: Brain Lobes  
Source: National Institute on Drug Abuse (1997). Mind Over Matter: The Brain's Response to Drugs Teachers Guide. NIH publication # 98-3592.
- OH#9: Figure of a Neuron (colored figure)  
Source: Arthur's Medical Clipart
- OH#10: Cartoon: Millions of Messengers  
Source: Illustration from Microsoft Clipart.
- OH#11: Cartoon: Anatomy of a Canine  
Source: Mark Parsisi, Off the Mark Cartoon,  
<http://www.offthemark.com/images/Sundays/Sundays154.gif>
- OH#12: Neurons: Transmitters of Impulses (Synapse)  
Source: Arthur's Medical Clipart
- OH#13: Figure of a Neuron (dendrite trees)  
Source: Arthur's Medical Clipart
- OH#14: Your Central Nervous System  
Source: Arthur's Medical Clipart
- OH#15: The Care and Feeding of Your Brain (colorful vegetables)  
Source: Retrieved from the World Wide Web at Alamy images (<http://www.alamy.com>) and Classroom Clip Art (<http://classroomclipart.com>)

OH#16: Protecting Your Brain (boy on bike with helmet)  
Source: Retrieved from the World Wide Web at Alamy images  
(<http://www.alamy.com>) and Classroom Clip Art  
(<http://classroomclipart.com>)

OH#17: Reflex and illustration of Finger to Brain Messages  
Source: Illustration from Animation Gold.com

### **Module Teaching Aides:**

TA #1: Jello Mold of a Brain (ordering directions: [www.brainstore.com](http://www.brainstore.com), or [www.scienceandmore.com](http://www.scienceandmore.com), or Qwiggle-Gel Brain Mold. Anatomical Chart Company, 822 Kimball Avenue, Skokie, Illinois, 60076-2956, 1-800-621-7500

TA #2: Word Scramble of The Brain, developed by Joanne Schrinisky using the [www.school.discovery.com](http://www.school.discovery.com) website:  
<http://puzzlemaker.school.discovery.com/code/BuildWordSearch.asp>

TA #3: The Neuroscience for Kids Coloring Book by Eric H. Chudler  
([www.faculty.washington.edu/chudler/neurok.html](http://www.faculty.washington.edu/chudler/neurok.html))

### **Pre and Post Test Questions for Module 2:**

True or False: 1. Your skull is good protection for your brain. You don't need to wear a helmet when biking or roller blading.

True or False: 2. Your brain sends messages through cells called neurons.

True or False: 3. Only your environment (your surroundings, circumstances, or things that happen to you) affect your mental health.

### **Module 2 Resource List:**

Treays, R. (1996). Understanding your Brain: Usborne Science for Beginners. London, England: Usborne Publishing Limited, LTD

Rowan, P.(1998). Big Head: A Book about your Brain and Your Head. NY: Knopf.

Society for Neuroscience. Washington, DC, 11 Dupont Circle NW, Suite 500, 202-462-6688 [www.sfn.org](http://www.sfn.org)

Emotional Quotient Today, published by Six Seconds (1999) [www.eqtoday.com](http://www.eqtoday.com)  
National Mental Health Services Knowledge Exchange Network:  
[www.mentalhealth.org](http://www.mentalhealth.org) website

National Mental Health Association website: [www.nmha.org](http://www.nmha.org)

National Institute of Mental Health. [www.nimh.nih.gov](http://www.nimh.nih.gov) ,  
NIH publication No. 01-4929, "Teenage Brain: A work in Progress"

National Institute of Neurological Disorders and Stroke: [www.ninds.nih.gov](http://www.ninds.nih.gov)  
"Brain Basics: Know Your Brain", For information contact:  
BRAIN, P.O. Box 5801, Bethesda, MD, 20824, 1-800-352-9424

Chudler, E.H. Sam's Brainy Adventure (an interactive brain tutorial for kids)

<http://www.faculty.washington.edu/chudler/flash/main.html>

Pipe Cleaner Neurons, Bead Neurons, String Neurons

([www.faculty.washington.edu/chudler/chmodel.html](http://www.faculty.washington.edu/chudler/chmodel.html))

Play Dough Model of the Brain with Recipe

([www.faculty.washington.edu/chudler/chmodel.html](http://www.faculty.washington.edu/chudler/chmodel.html))

Group Activity: Message Transmission (as above, Chudler website)

The Brain vs The Computer (as above, Chudler website)

Brain Gummies ([www.brain-mart.com/brain\\_novelties.html](http://www.brain-mart.com/brain_novelties.html))