

General Introduction:

In the book *Falling Over Sideways* by Jordan Sonnenblick, Claire's father suffers a stroke. She acts promptly, which helps him have a better chance of recovery. The purpose of this academic program is to learn about the brain and different conditions and diseases that affect the nervous system such as strokes, and to find out if there are ways to prevent or lower the possibility of suffering from these conditions.

There are two parts in this Activity.

Activity Title: Learn about your brain and your nervous system

Part one: Parts of the Brain

Activity Introduction: The brain consists of several parts. Students will learn about major parts and the functions of each part. They may also learn about neurons, which also have major parts and functions.

TEKS:

Science, Seventh grade-12 b, c

Detailed Description:

Students will learn the parts of the brain by looking at a poster or web page. In groups of two or three, they will create a model of the brain that indicates the different parts by color using play-doh or clay (you can make your own play-doh by using flour, salt, and water. A recipe is included in the resources.) They will be assessed on the accuracy of the model and by taking a brief quiz. This activity may be introduced at the end of one class period. Creating the models should take no more than one class period; the assessment may take part of another class period if students are still finishing the models at the end of the period.

Have each color of the play-doh or clay divided into the number of student groups. There should be six colors: one for each type of lobe, one for the cerebellum, and one for the brain stem.

Step one: Project or hand out a detailed model of the brain for them to refer to as they create their brain model.

Step two: After the teacher checks the plan, students will retrieve their play-doh or clay.

Step three: Students will create their models and label the parts of the brain with names of the parts and the main functions of each.

Assessment: Models will be assessed using a rubric.

As individuals, students will complete the brain quiz from the Resources section.

Differentiation for pre-AP or GT: In addition to the brain model, students will create a model of a neuron using clay or play-doh and learn its parts and functions.

Step one: Along with the brain handout or projection, also include a neuron handout or projection. Students can plan their neuron model and their brain model at the same time.

Step two: same as above.

Step three: The neuron will also be labeled according to parts and their functions.

The assessment will include general neuron information. (For extra credit, students could name the three kinds of neurons.)

Activity Resources (produced by the committee)

Brain Quiz

Brain quiz key

Brain and Neuron Quiz

Brain and Neuron Quiz Key

Model assessment rubric

Play-doh recipe

Activity Resources for Teens, Teachers, and Librarians

<http://faculty.washington.edu/chudler/neurok.html> This website is a complete and detailed resource about the neurosystem, including the brain and neurons. The Experiment section includes information on making models of both the brain and neurons. There are engaging activities in the Games section.

http://www.macmillan.org.uk/images/cancerinfo/longdescriptions/cancertypes/brain-lobesandfunctions_2012_accessible.jpg This is an image of the brain to project that meets all the criteria of the model; a good image to project.

<http://easyscienceforkids.com/all-about-your-amazing-brain/> In this resource there is another good brain image, including functions, that could be projected.

<http://www.enchantedlearning.com/subjects/anatomy/brain/Neuron.shtml> This is an image of a neuron that meets the criteria of the neuron model; it is also a good image that can be projected

http://www.mananatomy.com/wp-content/uploads/2011/04/neuron_types.gif This image shows the different kinds of neurons.

Part two: Brain Diseases and disorders

Activity Introduction: There are several brain disorders that affect many people. Students will learn about several of these, including stroke, Parkinson's disease, Alzheimer's disease, and Chronic Traumatic Encephalopathy (also known as traumatic brain injury), and record your information on a handout. Students may also learn about epilepsy, meningitis, Tourette's syndrome, muscular dystrophy, or another neurological disorder. This part of the activity could be done in a computer lab or library setting. Allow one or two class periods for this part of the activity, depending on the length of the class period

and the makeup and abilities of the classes. The handout could be completed at home if not finished in class.

TEKS:

Science, 7th grade-12 b,c

Step one: Divide students into groups of three or four. Assign each group one of the disorders. Include in the selections stroke, Alzheimer's disease, Parkinson's disease, Tourette's syndrome, and Chronic Traumatic Encephalopathy, also known as traumatic brain injury. If you have more students that need topics, assign epilepsy, meningitis, and cerebral palsy, depending on how many students are in your class. If more topics are needed, refer to this list from the National Institutes of Health:

<https://www.ninds.nih.gov/Disorders/All-Disorders> and select disorders that the students might recognize. Take a few moments to remind students not to plagiarize.

Step two: Students will consult print and online sources to answer the study questions on the Disorders and Diseases of the Brain handout in the Resources section below. Suggested sources include books on the specific disorders, encyclopedias of diseases, subscription databases such as Encyclopedia Britannica and Gale Cengage that Texas school libraries may have available through TexQuest, reliable websites suggested in the Resources section or others that the teacher may be aware of and wish the students to use.

Step three: Students will make a presentation using Power Point or other presentation software to present the information learned about their disorder. The presentation will consist of four sections: Definitions and causes of the disorder, Symptoms of the disorder, how the disorder affects the life of the patient and the family and friends, and Prognosis (whether or not the disorder is curable and how long it might last). Presentations may be made to the class (allow two more days for this) or to another audience within the school or outside.

Alternatively, students can make a presentation board or poster using the information and including the same four sections. These can be displayed in the library or around the school.

Books to display in the Library to support this unit:

Falling Over Sideways by Jordan Sonnenblick

Curveball: The Year I Lost My Grip by Jordan Sonnenblick

Pop by Gordon Korman

The Nervous System by Christine Taylor-Butler

Brain Injuries in Football by Stephanie Watson

Concussions in Sports by Mary Ann Hudson

Alive and Well in Prague, New York by Daphne Grab

Michael Vey series by Richard Paul Evans

The Last Book in the Universe by Rodman Philbrick

Meningitis by Melissa Abramovitz

Parkinson's Disease by Melissa Abramovitz

Cerebral Palsy by Barbara Sheen

Activity Supply List:

Pencils or pens

Brain Disorder Handout for each group or student

Books about specific brain disorders and diseases, such as Parkinson's or Stroke (see above)

Regular or disease encyclopedia (Britannica, World Book, UXL Encyclopedia of Diseases and Disorders), either online or in print, or both

Incentives: NA

Resources (provided by the committee)

Brain Diseases and Disorders Handout

Assessment rubric

Activity Resources for Teens, Teachers, and Librarians

<https://www.ninds.nih.gov/Disorders/All-Disorders> : This page from the National Institutes of Health (U.S. Government) is one of the best sources for answering the questions on the handout.

Gale Cengage Science in Context online database: If this resource is available to you either through TexQuest or as a subscription, it is an excellent source for answering the handout questions.

Encyclopedia Britannica online database: If this resource is available to you either through TexQuest or as a subscription, it is a good source for answering the handout questions. It is recommended to use the high school option rather than the middle school option because the topics will be easier to access.