THE PUYALLUP FAIR PRESENTS:

An Exploration of the Brain

Did you know?

Ways to visit the **Puyallup Fair for free:**

Get in free on the first Friday of the Fair (September 11) from 10 a.m. – 12 p.m. with a recommended donation of a non-perishable food item to benefit the local FISH Food Bank. Help feed those less fortunate while enjoying all the Puyallup Fair has to offer on opening day!

For students, gate admission

is FREE! The Puyallup Fair offers tickets to most schools in Western Washington, so if you're a student all you have to do is ask your teachers or principal for your ticket.

Chapter 1: **BRAIN POWER**

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This year the Fair will feature Al's Brain.

This free exhibit next to the Planting Patch at the Fair will take you on an interactive journey through the human brain. There is a 3-D movie in the "Brainitorium" featuring Grammy Award-winning musician "Weird Al" Yankovic. You'll also find entertaining educational material, as well as interactive Brain Power exhibits from the Pacific Science Center. You can also get a Passport stamped from this exhibit and other educational sites at the Puyallup Fair to take back to your teachers.

Best of all, you can enter for a chance to win a meet-and-greet with Weird Al on September 26 at the Puyallup Fair, by visiting thefair.com.



BRAIN SUMMARY

The Brain controls every part of your body. Think of it as your body's CEO. Any conscious or unconscious functions your body performs are planned, coordinated and executed by your brain. This includes breathing as you walk through Hobby Hall, singing along at a concert, clapping for your favorite cowboy or cowgirl, petting the rabbits at the Fair Farm and even clenching your safety harness at the top of the Extreme Scream. Your brain even controls your heart and tells it to beat. Did you know that you blink about once every 4 to 5 seconds? We don't have to remind ourselves to blink each time; our brain does that for us.

Without your brain you would not exist. Our brain is so important that it receives almost 20 percent of our blood supply directly from our heart. The blood takes oxygen and nutrients to the brain so it can continue its work.

Your brain is made out of very soft material similar to dough. Can you believe that such a complex and important organ is that soft? Our skull acts as a protector for our brain to make sure it stays safe. Teenage and adult brains weigh nearly three pounds, and are the size of your two

fists put together. Most times when we see brains they appear gray in

MIND CHECK

TAL LOBE

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Write out the number 100 billion. How many zeros are to the right of the 1?

NERVOUS SYSTEM AND NEURONS

The brain is the commander of your nervous system. It connects to the rest of your body through a series of neurons and nerves. Neurons are brain cells. They are very small — some are only 4 microns wide! We have over 100 billion neurons in each of our brains when we are born.

Once your nerves get a message from your brain, they can send it out to the other parts of your body. They also can carry messages back to the brain. If you just can't wait for your corn to cool before you eat it, your nerves will send a report to your brain and your brain will send back a signal to blow on your corn to cool it down. We have nerves all over our body to help us sense our surroundings. What areas of your body do you think have the most nerves?

MIND CHECK

If an adult brain weighs three pounds and an average adult male is about 190 pounds, what percentage of your body weight is your brain? Since we know the brain gets 20 percent of our blood supply, is the brain receiving more or less blood than other parts of your body? Why?

color because they no longer have blood in them, but brains are really a grayish pink color.

BRAIN TEASER

Wilder Penfield was a doctor and researcher in the 1950s. He conducted experiments on epilepsy patients' brains and found that the most sensitive body parts require the most brain space. He made a drawing of a human that shows their body parts relative to the brain space they take up. This is called the homunculus.

PREDICT: Which body parts do you think he made the largest? Which are the smallest? Draw your own version of the homunculus based on these predictions. Do research to find this drawing and determine which body parts take up the most space in our brain.



Here's a great recipe to make your own brain out of dough.

Materials:

To make one dough brain, you will need the following: 2 cups water

- 2 cups flour (10 lb bag = 8 brains)
- 1 tbsp. cream of tartar
- 1/4 cup vegetable oil
- 1 cup salt (5 lb bag = 8 brains)
- Red food coloring
 1 gallon sized Ziploc® bag

Suggested materials:

- Tools for sculpting
- 1. Combine the water, flour and cream of tartar in a large bowl. Mix together until the lumps disappear.
- 2. Add the vegetable oil to the mixture.
- 3. Put this mixture in a sauce pan and add the salt. Add 2 – 3 drops of red food coloring before cooking the mixture. Stir and cook over low heat until the mixture thickens.
- 4. Pour the mixture out and let it cool. The dough can now be kneaded and divided evenly into the Ziploc bags for use, one "brain" per 3 – 4 students.

Divide the clay for constructing clay brain models into pieces for each student. Use sculpting items to carve details into the brains.

BRAIN BASICS

There are three main parts in our brains. They are listed below with their functions.

MIND CHECK

If your right hemisphere lost some of its functions, what hand might you have to write with? If that is not the hand you already write with, you would have to learn to write all over again.

The cerebrum controls thinking and speaking along with other bodily functions. Your cerebrum is divided into two parts called hemispheres. The left hemisphere controls the right side of your body and the right hemisphere controls the left side of your body. The two hemispheres are connected by something called the corpus callosum that allows the two sides to communicate with each

Cerebellum: Cerebellum means "little cerebrum" and that is exactly what it looks like. The cerebellum is the small part of the brain just behind and under the cerebrum. It coordinates and controls your

movement and balance. As you trot into the show ring on your horse, reach out to grab a scone or walk through the quilt display, your cerebellum is working.

Brain Stem: The brain stem connects your brain to the rest of your body through your spinal cord. Every message passed back and forth from your body to your brain has to pass through the brain stem. This part of your brain controls the vital functions in your body such as your heart beating, your lungs breathing and your eyes blinking so you don't have to think about them.

BRAIN TEASER

The brain is more wrinkled than a raisin. Why? Brains are wrinkled so they can have a larger surface area without taking up as much space. If you ironed out those wrinkles and laid out your brain flat it would be about as big as a newspaper page — that would make one big rectangular head!

Sources:

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Cerebrum: This is the largest part of your brain.

other. The cerebral cortex is the outermost layer responsible for high level functions like communication and math.