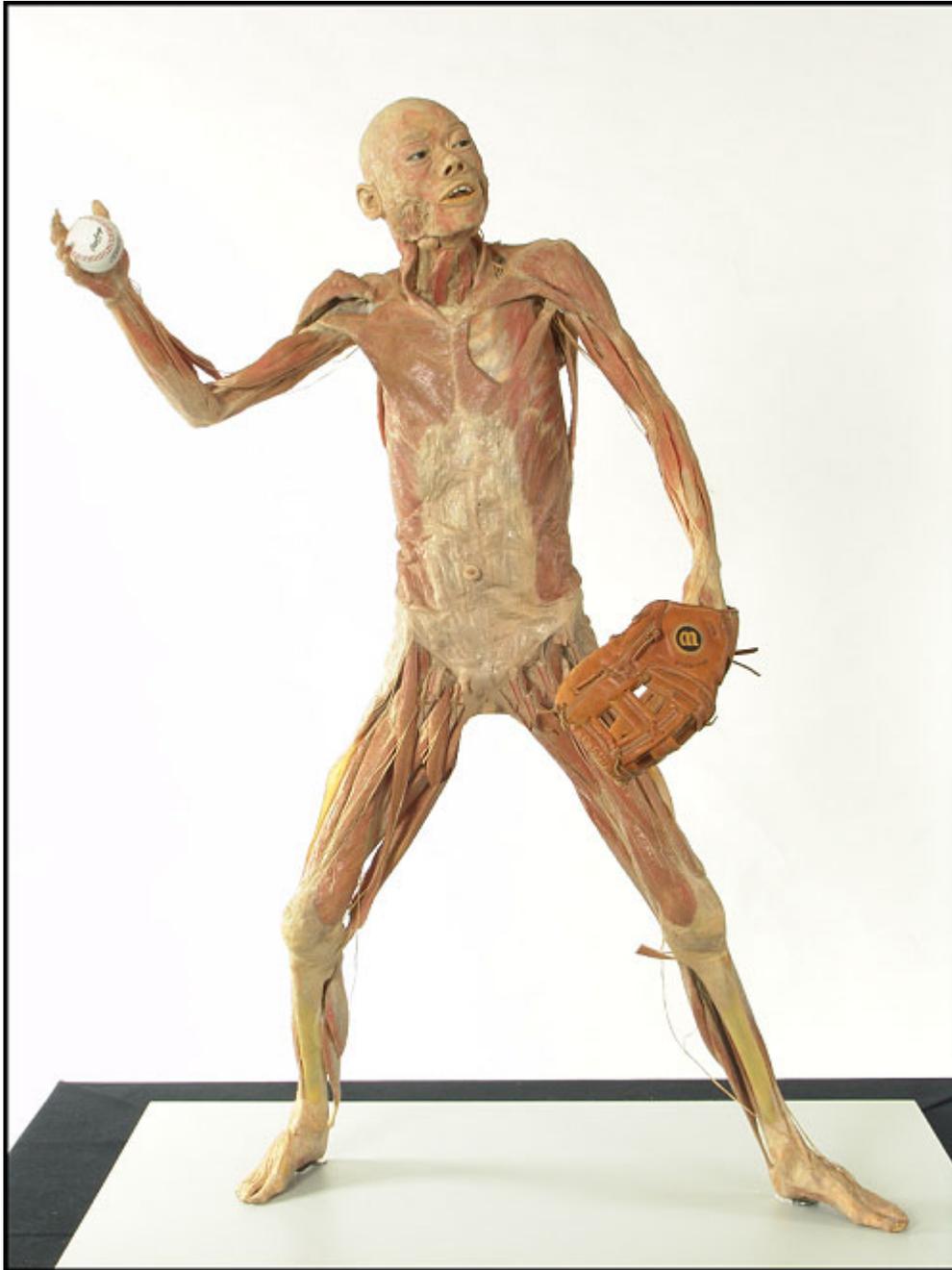


OUR BODY

THE UNIVERSE WITHIN



The Universe Within Family Outing

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Dear Parents,

The UNIVERSE WITHIN is a fascinating educational exhibit consisting of actual human bodies and organs. Appropriate for all ages, this exhibit literally goes “under the skin,” revealing the mysteries of human anatomy.

The bodies and organs have been preserved using a process known as polymer impregnation. The UNIVERSE WITHIN allows you insight to the inside; giving you a true look at the inner working of the extraordinary human body.

The unique method used to preserve the human bodies in the UNIVERSE WITHIN is called polymer impregnation. Polymer impregnation involves a vacuum process that replaces the body’s water and fat with reactive plastics. The plastic is initially pliable; enabling the bodies to be placed in different life-like positions, and then hardens after infusion. It takes approximately 1,500 hours to transform a cadaver into a full-body plastinate. Organs are identical to their pre-preservation state down to the microscopic level. Polymer specimens are completely dry and odorless. After each cell is infused with liquid plastic, the body is posed. Needles and pieces of foam rubber are used to hold muscles and nerves in place until the plastic is hardened.

There is some important information to keep in mind prior to bringing children to the exhibit. The specimens in the exhibition come from voluntary body donors or individuals who agreed that upon their death, their bodies could be used for medical science and the study of anatomy. In addition, the whole body specimens reveal bones, muscles, tendons, nerves, blood vessels, and organs, including the genitals.

As you enter the exhibit, you will have the opportunity to examine the human body as a whole. Continuing throughout the exhibit, you will journey through each of the body’s major systems allowing you to see first hand how they function and relate to other systems.

The UNIVERSE WITHIN is an amazing opportunity for science enthusiasts to explore and discover the wonders of the human body.

The goal is to create an experience for visitors of all ages to explore anatomy first hand, thanks to the revolutionizing process of plastination. Familiarity with the plastination process, along with the specifics of the exhibit prior to your visit will allow for a more enjoyable and valuable educational experience.

Please review the materials and exhibit description before deciding whether or not to bring your children to the UNIVERSE WITHIN.

Tips for preparing children

- Review the website content, particularly the Family Outing, the Frequently Asked Questions, and the Plastination Process prior to attending in order to prepare yourself for questions.
- Discuss the visit with your children in advance. Explain what they will see and the purpose of the exhibit. Be prepared to answer more questions during your visit.
- Answer your children's questions in an honest and straightforward fashion. It's ok not to know all the answers. Use these teachable moments to expand their and your knowledge by looking up the answer in a book or on the internet.
- Children understand concepts better when they can relate to the information. Take the opportunity to relate different parts of the human body to your child's hobbies.
- Be sensitive to your children's as well as your reactions. People come away from the exhibit with many different interpretations.



Use this general outline and fun facts to add to your experience. Here's what you should expect to see.

THE UNIVERSE WITHIN contains approximately 200 actual human bodies and organs.

Visitors to **THE UNIVERSE WITHIN** will be introduced to the exhibit through the human body as a whole, and then taken through each of the body's major systems to see how each functions and relates to other systems:

MUSCULOSKELETAL SYSTEM

This exhibit uses a body in simulated motion to demonstrate how various muscle groups work together to keep a body in motion.

Related topics: athletics or recreational activities, sports injuries, walking, running, broken bones, sprained ankles.

Fun Facts:

1. Over half of the bones in your body are located in your hands and feet.
2. The only jointless bone in the human body is the hyoid bone in the throat
3. At birth, humans have 300 bones. As a baby grows, some of the smaller bones fuse together until there are only 290.
4. Muscles can move in only one direction. To compensate, the human body has complimentary or muscle groups opposite each other. For example the bicep and tricep in the arm.

CENTRAL NERVOUS SYSTEM – THE HEAD

The head exhibit depicts views of both the inside and outside of the skull, the location of the optic, acoustic, and olphactoric senses and the brain as part of the central nervous system.

Related topics: Five senses (sight, sound, smell, taste, and touch), memory

Fun Facts:

1. There are an estimated 1 billion neurons in the human brain
2. The cornea, the outermost layer of the eye, is the only living tissue in the human body without blood vessels. It receives nutrients from tears and from the aqueous humor.
3. Newborns can only see approximately as far as their nose
4. On the human tongue, the four well-known taste receptors detect sweet, salt, sour, and bitter.
5. Our sense of taste is partially enhanced by smell, which is why food may taste bland when we have a cold that blocks the nasal passages.

NERVOUS SYSTEM

The nervous system display shows the brain as center of motor, emotional and sensitive system.

Related topics: Testing reflexes at the doctor's office, pulling your hand back from something hot

Fun Facts:

1. While the brain and the spinal cord constitute the central nervous system, the so-called cranial- and spinal nerves form parts of the peripheral nervous system.
2. The peripheral nerves connect the central nervous system with the sense organs, i.e. the organs for vision, hearing, smell, taste and perceptual touch, and other muscles and glands.

DIGESTIVE SYSTEM

The digestive system is composed of the stomach, small and large intestines, liver and pancreas.

Related topics: Healthy diet, food groups, stomach aches, alcohol & drug abuse

Fun Facts:

1. About $\frac{2}{3}$ of the body is water
2. Scientists estimate that almost 400,000 cases of cancer in the U.S. could be prevented solely through changes in the diet.
3. The liver is the largest gland and the second largest organ in the human body.
4. Digestion begins when you chew your food.
5. The entire digestive process takes approximately 72 hours.

RESPIRATORY SYSTEM

The respiratory system display consists of a tracheal tree and lungs. Also on display are lungs from a smoker, allowing you to compare a healthy and diseased organ.

Related topics: Smoking, aerobic exercise

Fun Facts:

1. You lose about $\frac{1}{2}$ liter of water a day through breathing
2. The surface area of the lungs is about the same size as a tennis court
3. When you sneeze, you can produce wind speeds as great as a hurricane or tornado.

CARDIOVASCULAR SYSTEM

The cardiovascular system demonstrates how blood flows through the body from the heart and from the organs back to the heart. The arteries are depicted in red and the veins are in blue.

Related topics: Aerobic exercise, heart rate or pulse, heart attacks

Fun Facts:

1. The adult human body contains 5-6 quarts of blood, while an infant has about 1 quart of blood
2. Capillaries are so small that red blood cells can only travel through them in single file.
3. The human heart beats about 40 million times a year.
4. The aorta is the largest artery in the human body? Its diameter is about the same as a garden hose.
5. The heart circulates the body's blood more than 1,000 times a day.

URINARY (EXCRETORY) SYSTEM

The excretory system has a detail of the kidneys, which filter the urine out from the blood. The urine is stored in the bladder and then is released from the body through the respective urogenital systems of women and men.

Related topics: Water consumption, Hygiene

Fun Facts:

1. During a lifetime, your kidneys clean over 1 million gallons of blood

Family Health & Exercise Survey

What can you and your family do to live a more healthy life? Here are some suggestions.

1. Using the United States Department of Agriculture website (<http://www.mypyramid.gov>) develop a food pyramid for the members of your family.

Resources include: My Pyramid Blast Off Game for Kids

Coloring Pages

Family Planning Kits

2. Track your aerobic exercise for one week. Monitor how much you exercise (including walking) for an entire week. Are there changes that you can make to improve your cardiovascular health? Maybe select an activity that you can enjoy as a family.

After Visit Discussion Questions

Talk about the exhibit with your children. Allow them to respond and to voice their opinions.

1. What effect did the exhibit have on you?
2. What did you learn as a result of seeing the exhibit?
3. What did you think of the plastinates?