BODY WORLDS Vital Frequently Asked Questions

What is BODY WORLDS?
The BODY WORLDS exhibitions are first-of-their-kind exhibitions through which visitors learn about anatomy, physiology, and health by viewing real human bodies using an extraordinary process called plastination. This groundbreaking method for specimen preservation was invented by Dr. von Hagens in 1977.

BODY WORLDS Vital features real human specimens, including whole-body plastinates, individual organs, organ configurations and transparent body slices. The exhibition also allows visitors to see and better understand the long-term impact of health, distress and disease on the human body.

What is the purpose of the exhibitions?
The BODY WORLDS exhibitions aim to educate the public about the inner workings of the human body and show the effects of poor health, good health and lifestyle choices. They are also meant to create interest in and increase knowledge of anatomy and physiology among the public.

Why is it important for the public to see these exhibits?
The BODY WORLDS team believes that when people understand more about how the body works and how it can break down, they are more likely to choose healthy and sustainable lifestyles. They also hope it will inspire visitors to learn more about the life sciences. Knowledge about what the human body looks like and how it functions is basic life science information that should be available to everyone.

Couldn’t I learn just as much from books or models of human anatomy?
Real human bodies show the details of disease and anatomy that cannot be shown with models. They also allow us to understand how each body has its own unique features, even on the inside. Visitors are drawn to real specimens in a way that they are not to plastic models. One of the special features of visiting the exhibition at a venue such as the Science Center of Iowa is that people have a chance to see the real thing in a safe and informative environment.

What is Plastination?
Invented by scientist and anatomist Dr. Gunther von Hagens in 1977, plastination is the groundbreaking method of halting decomposition and preserving anatomical specimens for scientific and medical education. Plastination is the process of extracting all bodily fluids and soluble fat from specimens, replacing them through vacuum forced impregnation with reactive resins and elastomers, and then curing them with light, heat, or certain gases, which give the specimens rigidity and permanence.

Where did the specimens on display come from?
Will we know who the plastinates are or how they died?
The BODY WORLDS exhibitions rely on the generosity of body donors; individuals who bequeathed that, upon their death, their bodies could be used for educational purposes in the exhibitions. All of the whole-body plastinates and the majority of the specimens are from these body donors; some specific specimens that show unusual conditions come from old anatomical collections and morphological institutes. As agreed upon by the body donors, their identities and causes of death are not provided. The exhibitions focus on the nature of our bodies, not on providing personal information.

Why are the plastinates posed the way they are?
The poses of the plastinates have been carefully thought out and serve educational aims. Each plastinate is posed to illustrate different anatomical features. The poses allow visitors to relate the plastinates to their own bodies.
Will I be able to touch any of the plastinates?
While you will be able to get very close to the plastinates, please be respectful of the preserved specimens and do not touch them.

Is this exhibition appropriate for children?
More than 32 million people, including young children, have viewed the different BODY WORLDS exhibitions around the world. It is important to note that the exhibition includes whole-body plastinates with exposed genitals. To ensure an enriching experience for all, the exhibition is recommended for children ages 10+ and those under the age of 17 should be accompanied by a responsible adult, parent, guardian or school chaperone.

Is there an audio tour?
You may purchase an audio tour in English at the Box Office upon arrival at the Science Center of Iowa. Cost is $5 for non-members and $3 for SCI members. Written descriptions in English also accompany the plastinates and specimens.

How long can I stay inside the exhibition?
Recommended time is one to two hours, but feel free to stay as long as you like within business hours. The length of time will vary on how long each visitor wishes to examine each specimen and read the information provided. An audio tour will increase your time in the exhibit.

Can I take photos or video in the exhibition?
Photography and filming, including pictures taken with cell phones, are not allowed in the BODY WORLDS Vital except by accredited members of the media.

Is the exhibition accessible to people with disabilities?
The exhibit is fully handicap accessible. Inquire at the SCI Box Office upon arrival for use of a wheelchair free of charge during your visit.

What are visiting hours and ticket prices to see this exhibition?
Visit sciowa.org/bodyworldsvital for more information.

How can I prepare myself and those visiting with me for the BODY WORLDS Vital experience?
Visit sciowa.org/bodyworldsvital and check out Education & Resources before you arrive at SCI. Guides, activities and links to more information are available for families, educators and students.

What IMAX film is recommended with this exhibition?
SCI recommends The Human Body, a 45-minute IMAX documentary film that explores a day in the life of your body. Find more information and showtimes at sciowa.org/IMAX.

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Here are some tips for visiting BODY WORLDS with children

Review the contents of this Family Guide, especially the Frequently Asked Questions section, prior to attending.

Bring this Family Guide with you to the exhibition.

During your visit, try to relate elements of the exhibition to experiences in your child’s life (e.g. “Did you have any idea that you used so many muscles when you play soccer?”)

Answer your children’s questions honestly. It’s okay not to know all the answers. You might say, “I don’t know the answer to that question, but we can look it up in a book or on the internet when we get home.”

Be sensitive to your own and your children’s reaction. People come away from this exhibition with many different interpretations.
Exhibition Overview
including Family Fun Facts

Learn with BODY WORLDS
In an adult there is:
- Enough fat to make two dozen big bars of soap.
- Enough sulfur to kill all the fleas on a dog.
- Enough lime to whitewash a chicken coop.
- Enough carbon to make the lead for 9,000 pencils.
What is Plastination?
The method of Plastination explained

Plastination is a relatively simple process designed to preserve the body for educational and instructional purposes. Plastination, like many revolutionary inventions, is simple in concept:

Embalmapping and Anatomical Dissection
The first step of the process involves halting decay by pumping formalin into the body through the arteries. Formalin kills all bacteria and chemically stops the decay of tissue. Using dissection tools, the skin, fatty and connective tissues are removed in order to prepare the individual anatomical structures.

The Plastination process itself is based on two exchange processes:

Removal of Body Fat and Water
In the first step, the body water and soluble fats are dissolved from the body by placing it into a solvent bath (e.g., an acetone bath).

Forced Impregnation
This second exchange process is the central step in Plastination. During forced impregnation, a reactive polymer, e.g., silicone rubber, replaces the acetone. To achieve this, the specimen is immersed in a polymer solution and placed in a vacuum chamber. The vacuum removes the acetone from the specimen and helps the polymer to penetrate every last cell.

Positioning
After vacuum impregnation, the body is positioned as desired. Every single anatomical structure is properly aligned and fixed with the help of wires, needles, clamps, and foam blocks.

Curing (Hardening)
In the final step, the specimen is hardened. Depending on the polymer used, this is done with gas, light, or heat.

Dissection and Plastination of an entire body requires about 1,500 working hours and normally takes about one year to complete.

Sheet Plastication
Sheet Plastication is a special form of Plastination. For this process, the body is deep frozen and cut into slices of 2 to 8 mm in thickness (1/12 to 1/3 inch). Instead of silicone, polyester resin or epoxy resin are used for impregnation.

Learn with BODY WORLDS
The BODY WORLDS exhibits reveal how human bodies work when people take part in activities like sports, dance, chess or teaching. Different displays focus on different systems in the body. In today’s paper, find a photo of a person involved in an activity that interests you. Think about what the body has to do for that activity. Then write a paragraph describing what part or system of the body you would like to show if you could create a plastinate in action.
The human body is composed of various organ systems working together in an orderly fashion to form a unified whole and to perform the functions of life.

The body's movements, including both stationary and forward motion, constitute a significant portion of these functions.

Movements are made possible by what is known as the locomotive system which consists of the bones, muscles and joints.

**Cool Fact:**
At birth, humans have 300 bones. As a baby grows, however, many of the smaller bones fuse together so that adults have just 206 bones.

**Learn with BODY WORLDS**
Half of all your bones are in your hand and feet. The average person’s muscles do an amount of daily work equivalent to loading 10,886 kilograms onto a 1.2 metre-high shelf.
The Central and Peripheral Nervous System

All bodily functions are monitored and regulated by an extraordinarily precise network of nerve fibres stretching from head to toe.

These fibers originate directly in either the brain or spinal cord and become increasingly fine as they branch out into the peripheral regions of the body.

Neurons and their axons are the building blocks of the nervous system. These cells constitute the body’s communication system, generating and transmitting weak electrical signals.

The number and sequence of these signals transfer information from one region of the body to another.

Cool Fact:
The nervous system carries messages from the brain to other parts of the body at more than 100 miles per hour.

Learn with BODY WORLDS
Your brain, many times more complex than the best computer, operates on the amount of electric power that would light a 10-watt bulb. The brain weighs about 1.3 kilograms—1/50 of your total adult weight. The brain is an oxygen eater. The brain uses 1/4 of the oxygen you take in.
The Respiratory System
Oxygen in, carbon dioxide out

Human life requires a continuous supply of oxygen which we extract from the air.

Without this element, most of the body’s cells would not be able to survive more than a few minutes.

Oxygen is indispensable for cell metabolism, a process that transforms nutrients into energy to keep the body functioning.

Cool Fact:
Every minute you breathe in 7 litres of air. When you are doing physical activity this number can increase to 57 litres of air per minute.

Learn with BODY WORLDS
When you sneeze you can produce wind speeds as great as those in a hurricane or even a tornado. Lungs are made up of about 600 million spongy bags called alveoli. The total surface area of the lungs is about the same size as a tennis court. Lungs are the only organ in the body light enough to float on water.
The Cardiovascular System
The body’s great pump

Cool Fact:
At every stage of life, your heart is about the size of the fist you make when you close your hand.

This is an organism’s major transport system. Not only does the circulatory system distribute nutrients, oxygen and hormones to individual regions of the body; it also collects metabolic by-products which are then eliminated.

The heart is the engine of this system, and the dense network of blood vessels form the transport routes.

Learn with BODY WORLDS
If all the vessels of this network were laid end to end, they would extend about 60,000 miles, far enough to circle Earth more than twice. The heart circulates the body’s blood more than 1,000 times a day.
The Digestive System
Converting food into energy

All of the organs of the human body require an uninterrupted supply of energy if they are to perform their functions properly.

Once they have been processed chemically, the nutrients present in food and absorbed through the digestive tract provide the organism with the energy that it requires.

The organs of the digestive tract break down food both mechanically and chemically in a way that allows the nutrients to pass into the blood, where they can be transported to each individual cell.

Cool Fact:
The whole process of digestion takes about 72 hours from end to end.

Learn with BODY WORLDS
The average person eats about 1.3 kilograms of food each day. That's about 497 kilograms of groceries each year. Chewing food takes from 5-30 seconds.
Post-Visit Activities and Discussion Questions

Activities and Discussion
While these activities can be used pre- or post-visit, they are recommended after you have visited the exhibition.

Activity: Reactions—what effect did the BODYWORLDS exhibition have on you?
Here are some reactions to the plastinates. Do you agree or disagree?

- Fake
- Complicated
- Scary
- Like they were made of plastic
- Like a model
- Normal
- Lifelike
- Funny
- Like a person
- Like they were trying to say something
- Interesting
- Serious
- Like they were made of meat
- Like a corpse
- Like someone I knew
- Dumb

Add some words of your own:

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

Explain what struck you the most about the exhibition:

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
Which features of the plastinates looked most authentic?

How would you describe the behaviour of other people looking at the plastinates?

Discussion Questions

Talk about the exhibition with your children. Allow them to respond and voice their opinions, and share your opinions with them.

- What effect did the exhibition have on you?
- What did you learn about your own body from seeing this exhibition?
- What can you do as an individual and as a family to best take care of your health?
Additional Resources

The Visible Human Project
Take an animated trip through the cross-section of a human body!

Kids Health Organization
http://kidshealth.org/kid/index.jsp
Kids can find out about nosebleeds, scabs, puberty, emotions and other cool human body stuff.

Body Quest
http://library.thinkquest.org/10348/
This is a great homework resource for students ages 11-16.