

# BODIES

THE EXHIBITION

CAMP ACTIVITY  
GUIDE



## CAMP ACTIVITY GUIDE

### Welcome to BODIES...THE EXHIBITION.

At BODIES...The Exhibition, you will study yourself from the inside out!

This fascinating Exhibition will show you how amazing your body is and how the intricate systems of the human body carry out extraordinary tasks everyday. By understanding how the body works, you can better take care of it and keep it healthy. By studying the systems of the body, you will come away with a new appreciation for life and the many lessons our bodies teach us everyday.

The activities in this packet are designed to enrich your experience before, during and after your visit to the Exhibition.

Introduction to the Exhibition  
Counselor Responsibilities  
What Campers Want to Know  
Camp Director Resources  
Camp Activities  
At the Exhibition  
Discussion and Reflection

## INTRODUCTION

Each gallery in BODIES...The Exhibition represents a different system of the body. Within each system you will view both full bodies and individual organs that support the structure and function of that system. You will see first-hand some of the many topics you have been studying in your Science classes at school.

Take your time going through the Exhibition. Read and see all that you can. Take notice of the plaques on the walls as they contain valuable information.

Remember that you are viewing real human bodies. Be respectful of them, your fellow campers and the other guests in the Exhibition. You will be assigned to a specific camp counselor before you begin your tour. Keep your voices low and stay with your counselor throughout each of the galleries. Also, you must turn off your cell phones. Please be aware that food, drink and/or cameras are not allowed at any time. If you are completing a written assignment, we ask that you do not lean on the glass cases to write. Docents in white lab coats are available throughout the galleries to answer your questions.

You may be surprised to see that the full body specimens are displayed out in the open. You can view them as close as you like but please do not touch any of the bodies. The Interactive Desk at the end of the Exhibition offers you the opportunity to hold, feel and touch real organs from the body!

If you are interested in looking at the items in the retail store, please stay with your chaperone. The same is true for restroom breaks. Some of the more popular items in the store for students (from \$4 - \$20) include shirts, key rings and magnets; and for teachers (\$10 - \$40) you will find mugs, Exhibition Catalogs and poseable skeletons.

Enjoy your remarkable journey through the human body!

## COUNSELOR RESPONSIBILITIES

As a camp counselor, you are responsible for helping your campers get the most out of this very unique learning experience. While some of you may be part of the teaching team at your camp, others may be counselors or parent volunteers with a limited background in Biology or Anatomy. The good news is that there are trained docents available to answer questions throughout the galleries in the Exhibition. You may also want to offer your campers an audio tour to listen to as they view the specimens in each gallery. In addition, there are reference books at the end of the Exhibition that campers are welcome to read through and thumb through as needed. Feel free to grab a book or a docent at any time during your tour.

To keep order, you need to stay with your assigned group of campers throughout your visit. If you leave a gallery, they leave a gallery. If you are still in a gallery, they are still in a gallery. Please supervise your campers in the retail area and in the restrooms as well.

While your campers are busy learning, discovering, questioning and reflecting, we ask that you help us reinforce some basic rules of museum etiquette. Keep your voices low. Do not gather at the entrances or exits to the galleries. Do not lean against walls or block the flow of traffic for our other patrons. We have a very strict policy of no photography or cell phone use in the Exhibition. Some of your Camp Directors may have assigned worksheets for campers to complete as they move through the galleries. Please remind them not to lean on the glass cases or on the walls to write. They should use a notebook or a clipboard to fill out their papers.

We know that this is a fascinating Exhibition to view, but please know that your top priority is to monitor your campers and keep them focused.

We greatly appreciate your participation in making this a memorable field trip for everyone from your camp. Thank you!

**BODIES**  
THE EXHIBITION

## WHAT CAMPERS WANT TO KNOW

### Where do the full body specimens come from?

The full body specimens are persons who lived in China and died from natural causes. After the bodies were unclaimed at death, pursuant to Chinese law, they were ultimately delivered to a medical school for education and research. Where known, information about the identities, medical histories and causes of death is kept strictly confidential.

### What is Polymer Preservation?

Polymer Preservation, the process used to preserve the specimens for BODIES...The Exhibition, is a revolutionary technique in which human tissue is permanently preserved using liquid silicone rubber. This prevents the natural process of decay, making the specimens available to study for an indefinite period of time.

### How does it work?



Anatomists treat a specimen with chemicals to temporarily halt the decaying process. Then they dissect it to expose important structures.

All of the water is removed from the specimen by replacing it with acetone.

The specimen is placed into a liquid silicone mixture within a vacuum chamber. Under vacuum, the acetone becomes a gas that is completely replaced by the polymer mixture.

Lastly, the silicone polymer is hardened. The end result is a dry, odorless, permanently preserved specimen containing no toxic chemicals. It retains the look of the original but functions as if it were rubber.

### How long does it take to complete the preservation process?

Preparation time varies; a small organ may take only a week while a full body specimen may take up to one year to prepare.

### Which part of the anatomy is the hardest to preserve?

The brain. The brain is the most difficult organ to preserve because it is made up of mostly lipids (fat) and water. During the process of polymer preservation, the brain can shrink significantly. To manage this problem, the brain is dehydrated in cold acetone, allowing the specimen to better maintain its original size and shape.

## CAMP DIRECTOR RESOURCES

### *Fun Facts about your body:*

1. A human being loses an average of 40 to 100 strands of hair a day.
2. A cough releases an explosive charge of air that moves at speeds up to 60 mph.
3. Every time you lick a stamp, you consume 1/10 of a calorie.
4. A fetus acquires fingerprints at the age of three months.
5. A sneeze can exceed the speed of 100 mph.
6. Every person has a unique tongue print.
7. According to German researchers, the risk of heart attack is higher on Monday than any other day of the week.
8. After spending hours working at a computer display, look at a blank piece of white paper. It will probably appear pink.
9. An average human drinks about 16,000 gallons of water in a lifetime.
10. A fingernail or toenail takes about 6 months to grow from base to tip.
11. An average human scalp has 100,000 hairs.
12. It takes 17 muscles to smile and 43 to frown.
13. Babies are born with 300 bones, but by adulthood, we only have 206 in our bodies.
14. Beards are the fastest growing hairs on the human body. If the average man never trimmed his beard, it would grow to nearly 30 feet long in his lifetime.
15. By age sixty, most people have lost half of their taste buds.
16. By the time you turn 70, your heart will have beat some two-and-a-half billion times (figuring on an average of 70 beats per minute).
17. Each square inch of human skin consists of twenty feet of blood vessels.
18. Every human spent half an hour as a single cell.
19. Every square inch of the human body has an average of 32 million bacteria on it.
20. Fingernails grow faster than toenails.
21. Humans shed about 600,000 particles of skin every hour – about 1.5 pounds a year. By 70 years of age, an average person will have lost 105 pounds of skin.

### *Amazing Lung Facts:*

- At rest, a person breathes about 14 to 16 times per minute. After exercise it could increase to over 60 times per minute.
- New babies at rest breathe between 40 and 50 times per minute. By age five it decreases to around 25 times per minute.
- The total surface area of the alveoli (tiny air sacs in the lungs) is the size of a tennis court.
- The lungs are the only organ in the body that can float on water.
- The lungs produce a detergent-like substance which reduces the surface tension of the fluid lining, allowing air in.

### *Amazing Heart Facts:*

- Your heart is about the same size as your fist.
- An average adult body contains about five quarts of blood.
- All the blood vessels in the body joined end to end would stretch 62,000 miles or two and a half times around the earth.
- The heart circulates the body's blood supply about 1,000 times each day.
- The heart pumps the equivalent of 5,000 to 6,000 quarts of blood each day.

## WEBSITES:

<http://kidshealth.org/kid/>

Discover how the body works and what can make the body sick by reading through these expert articles written just for kids.

<http://library.thinkquest.org/10348/>

An exploration of anatomy designed for students between ages 11 to 16 years.

<http://yucky.kids.discovery.com/noflash/body/index.html>

This Web site explores the science behind eye gunk, ear wax, dandruff, and other bodily functions that are often considered “yucky” and “gross.” There is also a drop-down menu that provides information about systems of the body.

[http://www.lung.ca/children/index\\_kids.html](http://www.lung.ca/children/index_kids.html)

How do the lungs work? What hazards threaten the respiratory system? And what can kids do about them? This engaging Web site has information, printed worksheets and games for students of all ages.

## BOOKS:

### ELEMENTARY

Inside Your Outside! All About the Human Body. Tish Rabe. Random House, 2003.

Young children will love this Cat in the Hat -style introduction to the human body. Beginning readers will enjoy the rhyming and the illustrations. Whether children read this book independently or listen to it as a read-aloud, it will reinforce the science content. The topic is appropriate for early childhood education since learning about the body is included in national and most state standards. While other books on the subject of the human body go into greater detail and specificity and deal with the topic in a more scholarly way, this Seuss-like style has a great appeal for children. This book is a good choice for teachers looking to integrate reading and science.

### MIDDLE SCHOOL

Human Body Revealed. Sue Davidson and Ben Morgan. DK Publishing, 2002.

Visual representations of the body are nothing new. This volume is unique in the spectacular quality and quantity of images displayed. Use of transparent templates allows the reader to “peel away” layers, revealing the interactions among bodily systems. Index.

### HIGH SCHOOL

DK Guide to the Human Body. Richard Walker. DK Publishing, 2001

Dynamic computer-enhanced, three-dimensional illustrations reveal the inner world of the human body. Multiple imaging techniques such as X-ray, MRI, and CT scans present the reader with views of the human body from the microscopic to the macroscopic level. Each image helps to explain the complex functions of the body systems. Glossary, Websites, Index.

## CAMP ACTIVITIES

**Create A Travel Brochure for the Human Skeletal System.** As the travel writer for your local newspaper or magazine, you have been asked to design a brochure for a luxury tour through the human body's skeletal system. Be sure to highlight the trendy spots, all the exciting activities, and the imports and exports of the area. For insurance considerations, point out all possible dangers or special precautions that tourists might encounter during their visit.



**The Big Squeeze.** How long does it take to receive an impulse and react in a non-reflexive way? Here's a fun way to find out. Have campers sit on the floor, cross-legged in a circle. Assign one person to sit out and use a stop watch or second hand and time the activity. Each person in turn squeezes the ankle of the person to the right. As soon as that person feels the squeeze, he or she squeezes the next person's ankle, and so on around the circle. Stop the timer when the first person feels the squeeze from the last person in the circle. Divide the total time it took for the squeeze to go around the circle by the number of people in the circle to find the average time it takes for the impulse to go from the ankle to the brain and be processed into a reaction. Campers may wish to extend the activity with different impulses to see if the times are consistent.



**Complete An Anti-Tobacco Public Service Campaign.** Create a series of multimedia ads aimed at convincing people not to smoke. Write the copy, select the graphics and edit your ads so that your message is effective, to-the-point, and is taken seriously. Present your final campaign to your camp group and family.

**Investigative Reporter.** Choose a body part. Conduct an in-depth interview and write a story for your camp newsletter. *Ask ....* What is your job? Who is directly attached to you and what are their jobs? What diseases or illnesses can the human body catch or develop that directly affect you? What would life be like if you weren't there?

**Body Balloon Toss.** Facing a friend, try to keep a balloon in the air. Start by using your hands. Then one at a time, each of you calls out the name of a different part of your body. For example, if someone calls out "elbow", you may only use your elbow to keep the balloon in the air.

**Hanging Around.** Choose a friend and trace an outline of each other's bodies on paper. Cut around the body that was drawn. Cut the body apart at the neck, shoulders, elbows, wrists, thighs, knees and ankles. Fasten the body parts back together with paper fasteners. You have created your own body puppet! Label the different body parts. Draw the eyes, nose, ears, mouth and hair. Display each puppet around the room at camp.

**Riddle Me This.** Make up riddles about the human body. You must provide at least three clues. *Example:* I am part of the air. I enter your lungs when you breathe in. Your body needs me. What am I? (Oxygen).



**Three-Lettered Race.** Ready, set, go! Write 10 body parts that have three letters. (*Answers:* eye, ear, lip, arm, rib, hip, leg, toe, jaw, gum).

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E N E N E R N A T P R E E A E E M S C C P O R T L  
 N P I R P R S B K C E E R A N R I C E A R B L U E  
 E D R N G E N I R N E U L A I E N R K G E A S V N  
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 C E U N N E R L I S D L E R G E D D E B E X I H R  
 E E N Y P G G T N P L N E E C N S D R E S E O A X  
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 P S V P O S E E N R N N Y O T R A I N R E I R P I  
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 E T V A R S N G P R B E E O T A N N O P A S A P L

|         |        |           |          |
|---------|--------|-----------|----------|
| liver   | kidney | skeleton  | spine    |
| brain   | lungs  | stomach   | artery   |
| muscle  | spleen | appendix  | vein     |
| bladder | biceps | ligament  | tendon   |
| organs  | nerves | intestine | pancreas |

## Body Word Match

**Directions:** The table below contains body parts in two pieces. Find the segments that fit together and write them in the answer area below.

|      |    |     |     |
|------|----|-----|-----|
| ne   | eg | kn  | fa  |
| fo   | a  | ye  | ch  |
| shou | rm | nd  | e   |
| ck   | he | ba  | ce  |
| l    | ee | uth | e   |
| ot   | mo | ha  | est |
| ad   | ck | ar  | no  |
| lder | se |     |     |

**Answers:**

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## AT BODIES...The Exhibition

Each gallery in the Exhibition uses full-body specimens plus individual organs and parts to teach about the system or systems around which that gallery is designed.

1. Name something new that you learned about your skeletal system.
2. Write something interesting about two of the full body specimens in the Muscular Gallery.
3. Draw a picture of your brain.
4. When you feel your pulse are you feeling your artery or your vein?
5. Draw a healthy lung and a smoker's lung.
6. What is the heaviest organ in your body?
7. Draw your kidneys. They have a very unique shape.

*OPTIONAL:* Write 4 sentences on your reaction to the Fetal Gallery.

8. How many sections of the body do you see laid out in the case in the center of the final gallery?

## DISCUSSION AND REFLECTION

Take some time to record your reflections about your experience at BODIES...The Exhibition. You should fill at least the back of this page.

1. What was your first reaction when you entered the Exhibition? How did your reactions change by the time you got to the end, if they changed at all?
2. Do the bodies look different from the ones you've seen in textbooks? Explain.
3. Which gallery did you react to the strongest? Which gallery was most memorable? Why?
4. List 5 things you saw that you learned about in school.
5. List 5 things you saw that you never heard of before and found interesting.
6. What are 3 questions you still have about the human body and want answered when we return to camp?
7. Would you recommend this Exhibition to other people? Why or why not?

