



NATIONAL MUSEUM OF HEALTH AND MEDICINE

GENERAL TOUR

MUSEUM DISCOVERY TEACHER'S GUIDE GRADES 9-12

This guide will help you prepare for your visit to the National Museum of Health and Medicine. It outlines the major ideas and exhibitions that will be presented during the visit and suggests activities to help extend the experience into your classroom.

ABOUT YOUR TOUR:

You and your class will examine the history and innovations in military medicine from the Civil War through today, learn about the history of microscopes and explore the wonders of the human body.

TIME

90 minutes

GROUP SIZE

minimum of 10 students
maximum of 40 students

AT THE CONCLUSION OF THIS TOUR, STUDENTS SHOULD BE ABLE TO:

- Provide one innovation in Advances in Protection, Repairing, Rehabilitation, Research, Transportation and Facial Reconstruction as it relates to military medicine.
- Explain the relationship between organ systems.
- Identify the causes, diagnosis and care of traumatic brain injury (TBI).
- Describe how the museum was founded.
- Identify and describe an innovation that occurred during the Civil War.
- Describe the events surrounding President Abraham Lincoln's death.
- Describe biomedical engineering.
- Differentiate between the disease categories and list one example for each.
- Identify and describe both environmental and genetic factors that cause congenital anomalies.

EXHIBITIONS FEATURED IN THIS GUIDED TOUR INCLUDE:

"Military Medicine: Challenges and Triumphs"
"Anatomy and Pathology: The Fragile Organ"
"The Collections That Teaches:
The Museum's Collections"

HANDS-ON OBJECTS USED FOR THIS GUIDED TOUR MAY INCLUDE:

- Plastinated Organs
- Body Armor
- Civil War Surgical Kit, Chisholm Inhaler and Minié Balls



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SUGGESTED PRE-VISIT CLASSROOM ACTIVITIES

- Discuss *Visiting Our Museum* and what they will see.
- Discuss the different diseases and disorders associated with the body systems. This should include cancers, genetic disorders and communicable diseases. Have the students develop an infographic describing transmission, population and/or incubation periods for one of the diseases.
- Visit the museum's Facebook album page and choose a photograph(s) from the museum's archive collection for the students to analyze. Ask the students to make a list of observations about the photograph (for example, clothing, housing, food, etc.) and have them write an informational text about the photograph, including their observations.



SUGGESTED POST-VISIT CLASSROOM ACTIVITIES

- Investigate a medical professional career or interview a medical professional. Discuss their job, career path and education. Have the students present their research to the class. Have the class develop a health fair for their school. This may be a general health fair, a blood drive or focus on a specific illness or disorder. If you are able to raise money, donate the proceeds to a local charitable organization promoting health or disease awareness.
- Have students research current therapies or treatments used for service members returning from deployment. Have the students compare this to a previous conflict and describe how this has improved the health care of service members returning from war.
- Have the students choose one disease discussed on the tour. Have them create an informational brochure on the disease that should include pathology, treatment and prevention.
- Have the students evaluate the docent's presentation using the NMHM Tour Evaluation form (Appendix 1). Discuss their observations and opinions of the tour.





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VOCABULARY

AMPUTATION:

surgical removal of all or part of a limb

ANESTHESIA:

a method of preventing sensation, used to eliminate pain

ANTHROPOLOGY:

the study of humans

ASPIRATION:

the act of breathing and especially breathing in

AUTOPSY:

an examination of the body after death

BLOOD PRESSURE:

pressure exerted by the blood upon the walls of the blood vessels, especially arteries, usually measured on the radial artery by means of a sphygmomanometer

DISEASE:

an impairment of the normal state of the living animal or plant body that interrupts or modifies the performance of the vital functions and is a response to environmental factors, to specific infective agents, to inherent defects of the organism, or to a combination of these factors

ELECTRON MICROSCOPE:

a type of microscope that uses electrons to create an image of the target. It has much higher magnification or resolving power than a normal light microscope, up to two million times, allowing it to see smaller objects and details

HYPERTENSION:

abnormally high arterial blood pressure

MICROSCOPE:

an optical instrument used for observing small objects by magnification

OSTEOPOROSIS:

condition characterized by a decrease in bone mass and density which produces porosity and fragility. Results from disturbance of nutrition and mineral metabolism

PATHOLOGY:

the study of the nature of disease and its causes, processes, development, and consequences

PHYSIOLOGY:

the study of the mechanical, physical and biochemical processes of living organisms

PLASTINATION:

the process of preserving remains by injecting a solution containing a polymer (plastic) that maintains the original properties of the specimen

PERISTALSIS:

successive waves of involuntary contraction passing along the walls of the intestine or other hollow muscular structure that forces the contents onward

POLIO OR POLIOMYELITIS:

acute infection by the poliovirus, especially of the motor neurons in the spinal cord and brainstem, leading to muscle weakness, paralysis and sometimes deformity

PROSTHESIS:

an artificial device to replace a missing part of the body

PUBLIC HEALTH:

the art and science dealing with the protection and improvement of community health by organized community effort, including preventive medicine and sanitary and social science

TREPHINATION:

the surgical procedure in which a hole is drilled in the skull and a circular piece of bone removed



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RESOURCES

The appearance of hyperlinks does not constitute endorsement by NMHM or any other agency of the U.S. government of the destination website or the information, products or services contained therein.

WEBSITES

- **Science and Nature, Human Body and Mind** - <http://www.bbc.co.uk/science/humanbody/body/>
- **Cells Alive!** - <http://www.cellsalive.com>
- **Centers for Disease Control** - <http://www.cdc.gov>
- **Human Anatomy Online** - <http://www.innerbody.com>
- **Forensic Anthropology** - <http://library.med.utah.edu/kw/osteo/forensics/>
- **Body Worlds Plastination** - http://www.bodyworlds.com/en/plastination/idea_plastination.html
- **The Embryo App (available on iTunes)** - http://www.medicalmuseum.mil/index.cfm?p=media.news.article.embryo_app_debuts
- **Anatomy Study Guide App (available on iTunes)** - http://www.navy.mil/submit/display.asp?story_id=81642



PUBLICATIONS

- *The Human Body Book*, DK Publishing, 2007
- *Gray's Anatomy Book*, Henry F.R.S. Gray, 1992
- *The Anatomy Coloring Book*, Kapit and Elson, 2002
- *Stiff*, Mary Roach, 2004
- *The Forensic Casebook: The Science of Crime Scene Investigation*, Genge, 2002
- *From conception to birth: A life unfolds*, Alexander Tsiaras, 2002

BIBLIOGRAPHY AND LINKS

National Governors Association Center for Best Practices, & Council of Chief State School Officers. (2010). *Common Core State Standards*. Retrieved from www.corestandards.org

National Research Council. (1996). *National Science Education Standards*. Washington, DC: The National Academies Press.

National Research Council. (2012). *A Framework for K-12 Science Education: Practices, Crosscutting Concepts, and Core Ideas*. Washington, DC: The National Academies Press.

NGSS Lead States. (2013). *Next Generation Science Standards: For States, By States*. Retrieved from www.nextgenscience.org

Maryland State Department of Education. (2013). *Maryland State Curriculum*. Retrieved from <http://mdk12.org/instruction/curriculum/>



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NATIONAL SCIENCE STANDARDS

- Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts (HS- ETS1-3).



COMMON CORE

- Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9-12 texts and topics (RST.11-12.4).
- Initiate and participate effectively in a range of collaborative discussions with diverse partners on grades 9-12 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively (SL.11-12.1).
- Adapt speech to a variety of context and task, demonstrating a command of formal English when indicated or appropriate (SL.11-12.6).
- Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric, assessing the stance, premises, links among ideas, word choice, points of emphasis, and tone used (SL.11-12.3.).
- Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression (L.11-12.6).

APPENDIX 1: STUDENT TOUR EVALUATION FORM

Help NMHM improve field trips by telling us about your visit! Write clearly and answer each of the questions below. Return this form to your teacher. *Thank you!*

SCHOOL/GROUP NAME:

GRADE OR AGE:

TYPE OF TOUR:

DATE OF TOUR:

1. WRITE DOWN THREE THINGS YOU LEARNED ON YOUR TOUR.

2. WHAT WAS THE BEST PART OF YOUR VISIT TO NMHM?

3. WAS THERE ANYTHING YOU DIDN'T LIKE ABOUT YOUR VISIT TO NMHM?

4. THE VOCABULARY USED BY YOUR DOCENT WAS:

_____ Too easy---I would have liked more difficult vocabulary words

_____ Too difficult---I didn't understand the vocabulary words that were used

_____ Just right

5. THE AMOUNT OF INFORMATION PROVIDED BY YOUR DOCENT WAS:

_____ Too little---I would have liked to hear more information

_____ Too much---I would have liked to hear less information

_____ Just the right amount of information

6. WHICH TOPIC WOULD YOU LIKE TO LEARN MORE ABOUT?

_____ Diseases _____ Military Medicine _____ Forensics _____ Civil War _____ Biomed

7. WHICH ACTIVITY DID YOU LIKE THE BEST AND WHY?

_____ Holding artifacts or specimens, like the organs

_____ Working on the Discovery Sheets

_____ Talking with the Docent

_____ Exploring NMHM

8. WOULD YOU RETURN TO THE MUSEUM FOR ANOTHER TOUR OR PROGRAM?

___ YES ___ NO IF NO, WHY?

9. WHAT COULD WE ADD OR CHANGE TO MAKE THE FIELD TRIP MORE INTERESTING FOR OTHER STUDENTS?

10. WHAT EXHIBITS/TOURS WOULD YOU BE INTERESTED IN SEEING ON FUTURE VISITS TO NMHM?

11. HOW WOULD YOU GRADE YOUR FIELD TRIP?

_____ Great! _____ Good _____ Okay _____ I don't know

12. ADDITIONAL COMMENTS OR SUGGESTIONS:



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