



# San Diego Museum of Man

## Footsteps Through Time

### Guide for Students



#### ***Terminology***

The Museum of Man is a museum of anthropology. Some useful vocabulary includes:

Adaptation – The change in the structure or habits of an individual or species in response to a new or changing environment.

Ancient – Something or someone from the past.

Anthropology – The study of humans in all times and places. There are four main subfields in anthropology: archaeology, cultural anthropology, physical anthropology, and linguistics.

Archaeology – The study of the people of the past.

Artifact – Any object that was made and used by people.

Culture – The way of life for a group of people. Culture is learned and transmitted from one generation to the next by non-biological means.

Cultural Anthropology – The study of cultural similarities and differences in contemporary societies.

Evolution – A change in the genetic structure of a population. The term is also used to refer to the appearance of a new species.

Excavate – To dig. Archaeologists excavate to find artifacts.

Fact – In science, an phenomenon that has been repeatedly confirmed based on observation. New technologies can change our observation.

Hominid – Any bipedal primate mammal.

Hominoid – Apes and humans.

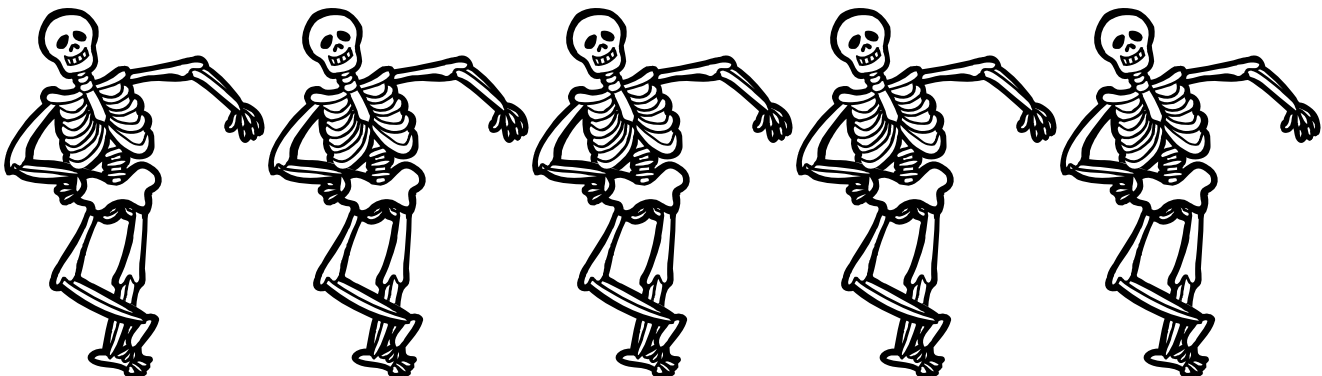
Hypothesis – A testable statement about the natural world that can be used to build more complex inferences and explanations. It can be supported or rejected.

Linguistics – The evaluation of cultural differences in communication.

Physical Anthropology—the study of human biology, the variation in biology of past and present populations, and adaptation.

Primate – A mammal of the Order Primates. Primates include prosimians, monkeys, apes, and humans.

Theory – In science, a well-substantiated explanation of some aspect of the natural world that can incorporate facts, laws, inferences, and tested hypotheses. A theory can be refined or even replaced by an alternate theory in light of new and compelling evidence.



# LOOK FOR THE “3 B’S”: BRAINS, BODIES & BEHAVIORS

AS YOU WALK THROUGH THE FOOTSTEPS THROUGH TIME EXHIBIT, LOOK FOR PATTERNS IN THE CHANGING BRAINS, BODIES, AND BEHAVIORS OF LIVING AND EXTINCT PRIMATES AND HOMINIDS. TRY TO ANSWER THE FOLLOWING QUESTIONS.

## Brains



### *In Primate Hall*

- Compare the skulls of a gorilla and orangutan to those of a gibbon and lemur. Whose skulls are bigger? Check out the brain casts to learn more about variation in primate brain sizes.
- What can you infer about brain size and tool use among chimpanzees and other Great Apes?

### *In Hominid Hall*

- What are the three genera of hominids in this exhibit? Is there an overall difference in the brain size of species belonging to each genus?
- Notice that some australopithecines have a bony ridge along the top of the skull. This ridge is called a sagittal crest. Did you see this feature on any other primate? Why do you think it is present on some primates, but not on others?
- Which genus of hominids is associated with stone tool use?

## Bodies



### *In Primate Hall*

- Stop at the Skeleton Comparison Station and examine the primate skeletons there. Which bones in the various species are similar and different?
- Examine the impressions of primate hands and feet. Pay close attention to the big toe. How are primate hands and feet adapted to life in the trees or on the ground?

### *In Hominid Hall*

- Examine Lucy’s skeleton. What parts of her body show she was adapted for bipedalism (walking on two feet)?
- What part of the skull indicates whether a species walked on two legs or four?
- Find “Turkana Boy.” How was his long, lean body adapted to the African savannah? Read about Neandertal bodies and compare how they were adapted to a different climate than “Turkana Boy.”

Paleoanthropologists cannot go back in time to study the behavior of extinct hominids. Instead they infer behavioral characteristics through living primate studies, and by a close analysis of fossils.

## Behaviors



### *Throughout the exhibit:*

- Take a look at the primate video stations. How are these behaviors similar to or different from human behaviors?
- What environmental factors caused changes in hominid behaviors?
- Today, humans can modify their environments. How does this flexibility in behavior affect natural selection?
- How will human behavior affect bodies and brains in the future?



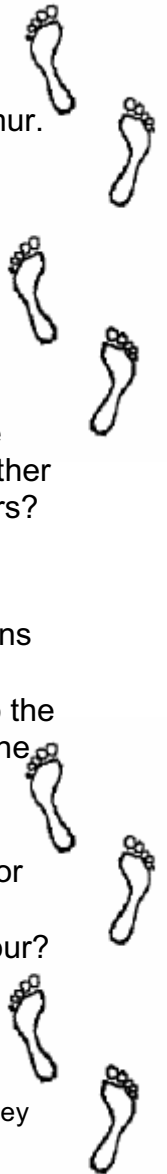
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CHECK OUT OUR WEBSITES!

[www.abouthumanevolution.net](http://www.abouthumanevolution.net)  
Exclusively for educators and students.

[www.abouthumanevolution.org](http://www.abouthumanevolution.org)  
A virtual tour of the *Footsteps* exhibit.

[www.museumofman.org](http://www.museumofman.org)  
Home page for the Museum of Man. Get current information about exhibits and upcoming events.





**THE TIME TUNNEL**  
**in the San Diego Museum of Man**  
*Footsteps Through Time Exhibit*  
**From an Engineer's Perspective**



**Engineering** is applying math and science to find solutions to real problems.

**Engineers** are innovators and inventors striving to improve life.

This guide was developed as an educational project of the  
**Society of Women Engineers – San Diego County Section**

<u><b>In the Year(s)</b></u>	<u><b>This Creation or Invention</b></u>	<u><b>Was a Result of</b></u>
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**Prehistoric Engineering – before the Bronze and Iron Ages**

1,300,000 B.C.	Hand Axes	Mechanical Engineering
380,000 B.C.	Brushwood Shelters	Structural Engineering
250,000 B.C.	Red Ochre Paint	Chemical Engineering
12,000 B.C.	First Pottery	Materials Engineering
6-5,000 B.C.	Fishing with Harpoons	Mechanical Engineering
4,000 B.C.	Glass	Chemical Engineering
4,000 B.C.	Simple Plow	Mechanical Engineering
3,500-3,001 B.C.	Potter's Wheel	Mechanical Engineering
3,000-2,501 B.C.	Cheops Pyramid	Civil Engineering



**Ancient Engineering – the Next 2,500 years**

(2,300 B.C. Bronze Age)

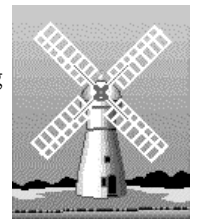
(2,000 B.C. Iron Age)

1,700 B.C.	Horse-drawn Chariot	Mechanical Engineering
1,400-1,200 B.C.	Woven Wool	Textile Engineering
1,000-800 B.C.	Papyrus Manufacture	Manufacturing Engineering
221-210 B.C.	Great Wall of China	Civil Engineering
200 B.C.	Use of Gears	Mechanical Engineering
193 B.C.	Invention of Concrete	Materials Engineering
<b>Early Engineering – the First Millennium A.D.</b>		
200 - 300	Wheel Barrows	Mechanical Engineering
200 - 300	Armored Cavalry	Materials & Mechanical Engineering
400 - 500	Iron Nails	Materials Engineering
800 - 850	Gunpowder	Chemical Engineering



**The Second Millennium**

1290	Eye Glasses	Optical & Medical Engineering
1326	Cannons	Mechanical Engineering
1370	Steel Crossbow	Mechanical Engineering
1521	Manufacture of Silk	Textile Engineering
1530	Spinning Wheel	Mechanical Engineering
1592	Windmills	Power Engineering
1608	Telescope	Optical & Mechanical Engineering
1775	Steam Engine	Mechanical Engineering
1793	Cotton Gin	Mechanical Engineering
1807	Paddle Steamer	Mechanical Engineering
1816	Stethoscope	Bio-medical Engineering
1832	Friction Matches	Materials Engineering
1834	McCormick Reaper	Mechanical Engineering
1839	Camera	Optical Engineering
1851	Sewing Machine	Mechanical Engineering
1857	Elevator	Mechanical Engineering
1877	Phonograph	Mechanical Engineering
1880	Electric Lights	Electrical Engineering
1859	Steamroller	Mechanical Engineering
1862	Solar Energy	Power Engineering
1875	Submarine	Mechanical Engineering
1876	Telephone	Communications Engineering





**THE TIME TUNNEL**  
**in the San Diego Museum of Man**  
*Footsteps Through Time Exhibit*  
**From an Engineer's Perspective (Page 2)**



**In the Year(s)**

**This Creation or Invention**

**Was a Result of**

1893 Automobile  
1893 Zipper  
1895 Radio Telegraph  
1903 Powered Plane  
1907 Radio  
1914 Panama Canal Opens  
1923 Television  
1926 Liquid Fuel Rocket  
1937 Golden Gate Bridge Opens  
1937 Jet Engine  
1938 Teflon  
1939 Helicopter  
1942 Computer (UNIX)  
1943 Aqualung  
1945 Microwave Oven  
1947 Cell Phone  
1947 Transistor  
1955 Atomic Power  
1955 Fiber Optics  
1955 Video Tape Recording  
1956 Artificial Intelligence  
1957 Sputnik I & II  
1959 Office Copier  
1960 Aluminum Cans  
1961 Electric Typewriters  
1961 Communications Satellite  
1966 FAX Machine  
1967 Hand Held Calculator  
1968 Virtual Reality  
1969 Video Recorder  
1969 Internet  
1970 Floppy Disk  
1971 Computer Microchip  
1972 Compact Disc  
1973 Mountain Bikes  
1974 MRI (patented)  
1976 Personal Computer  
1978 GPS  
1981 MS-DOS  
1981 Columbia, the First Space Shuttle  
1985 CD-ROM  
1986 MIR Space Station  
1992 World Wide Web  
1993 Pentium Chip  
1994 Channel Tunnel

Mechanical Engineering  
Mechanical Engineering  
Communications Engineering  
Aeronautical Engineering  
Communications Engineering  
Civil Engineering  
Communications Engineering  
Aeronautical Engineering  
Civil Engineering  
Aeronautical Engineering  
Materials Engineering  
Aeronautical Engineering  
Electrical Engineering  
Mechanical Engineering  
Power Engineering  
Communications Engineering  
Electrical Engineering  
Power Engineering  
Communications Engineering  
Data Storage Engineering  
Electrical Engineering  
Aerospace Engineering  
Optical Engineering  
Materials Engineering  
Electrical Engineering  
Communications Engineering  
Communications Engineering  
Electrical Engineering  
Software Engineering  
Data Storage Engineering  
Software Engineering  
Data Storage Engineering  
Hardware Engineering  
Data Storage Engineering  
Mechanical Engineering  
Bio-medical Engineering  
Hardware & Software Engineering  
Communications Engineering  
Software Engineering  
Aerospace Engineering  
Data Storage Engineering  
Aerospace Engineering  
Software Engineering  
Hardware Engineering  
Civil Engineering



**TheThird Millennium**

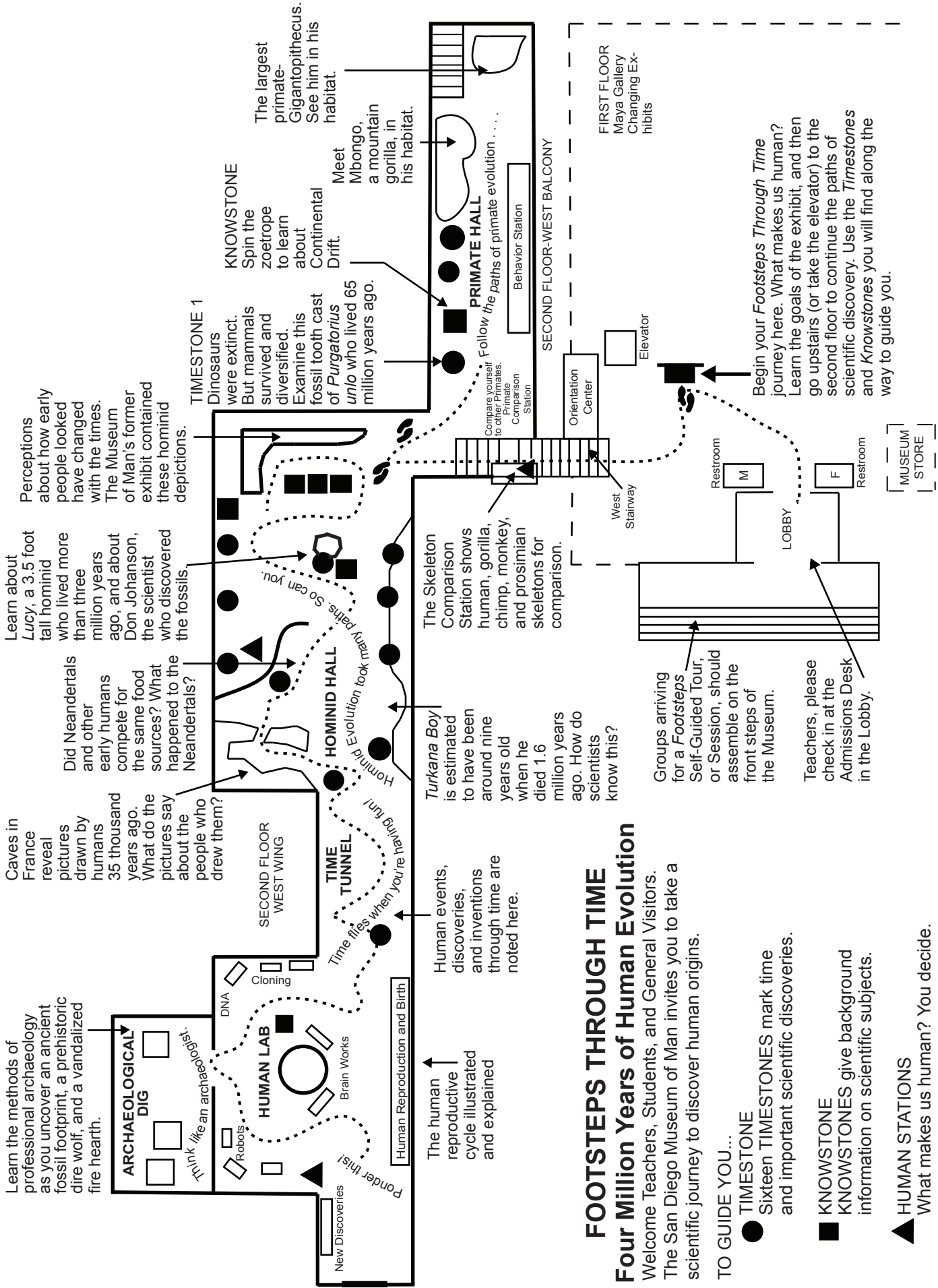
2001 Battery Powered Mechanical Heart

Bio-medical Engineering

**What will engineers of the future invent in the fields of Bio-medical, Power, Mechanical, or ???**

Rose Tyson  
Anthropologist  
San Diego Museum of Man  
Curator of Physical Anthropology

Laura Meldrum  
Computer Scientist/Software Engineer  
Society of Women Engineers  
National Career Guidance Committee



## FOOTSTEPS THROUGH TIME

### Four Million Years of Human Evolution

Welcome Teachers, Students, and General Visitors. The San Diego Museum of Man invites you to take a scientific journey to discover human origins.

TO GUIDE YOU...

- **TIMESTONE**  
Sixteen **TIMESTONES** mark time and important scientific discoveries.
- **KNOWSTONE**  
**KNOWSTONES** give background information on scientific subjects.
- ▲ **HUMAN STATIONS**  
What makes us human? You decide.