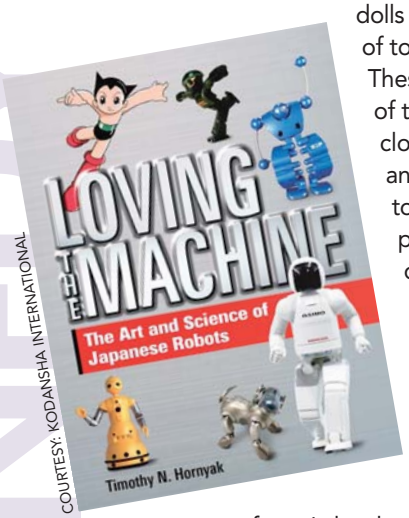
When viewing *Robotopia Rising* and participating in this guide's suggested activities, the following National Standards for Theater will be addressed: 6 and 8 and the following National Standards for Visual Arts will be addressed: 4 and 6.

Robotopia Rising

Friday, February 15, 2008
11 a.m. – 12 p.m. ET
Grades 9-12

Background Information

Before there was Asimo or Paro, there were mechanical dolls that could serve tea, play music, and even write. These automata are called *karakuri* dolls and are the distant ancestors of today's Japanese robots. These dolls utilized technologies of the Edo period such as clockwork mechanisms, gears, and springs to bring these dolls to life. Karakuri dolls helped pave the way for future developments, which eventually led to the field of robotics. However, the concept of robots did not take off until Tetsuwan Atomu's creation Mighty Atom also known as Astro Boy started filling the pages of comic books. The fictional cartoon shaped the Japanese attitude toward humanoid robots and inspired young scientists to begin building robots.



COURTESY: KODANSHA INTERNATIONAL

Meet the Robots

Robots are used for all types of purposes. For example, robots serve as receptionists greeting guests, working in assembly lines in factories, or comforting those who are ill.

Meet our first robot, Paro. Paro is not your typical seal. This furry friend is a therapeutic robot that provides comfort to people through physical interaction. Paro is used in hospitals and nursing homes throughout Japan and is designed to help patients become socially active as well as offer relief to patients through relaxation. Paro is modeled after a baby harp seal and has tactile, visual, auditory and postural sensors that allow it to behave like a real animal.

Developed by Tomotaka Takahashi, Chroino is a human-like robot whose friendly appearance was inspired by Japanese manga and anime. This robot uses a new technology called SHIN-Walk that allows for more sophisticated movements. Unlike traditional robots that walk with their knees constantly bent, Chroino is able to walk more naturally like a human being.

Aibo is one of several robotic pets. Developed and designed by Sony, this dog is considered an autonomous robot because it is able to learn and grow from external stimuli such as its owners or the environment. Manned with a camera, this dog is also able to "see" and can recognize spoken commands from its owner.

For the Japanese, Wakamauru is like a member of the family. The household helper is very useful for day-to-day life, offering real-time information such as the weather forecast and reading horoscopes. Wakamauru interacts with its owners through spontaneous communication and responds to the actions of others while acting autonomously.

Professor Hiroshi Ishiguro

Professor Hiroshi Ishiguro and his robot twin first made headlines when he redefined the term "distance learning." Ishiguro, of Osaka University, wanted to find a way to teach his classes without actually having to be present in the classroom. As a result, he developed his twin android or artificial human to serve in his place. Now Ishiguro can lecture and communicate with his students by simply controlling the robot or tele-operating. Professor Ishiguro continues to make great strides in the area of android science as he develops truly human-friendly robots by improving upon human-robot interactions.

Tomotaka Takahashi

The creator of the Kyoto University's spin-off Robo Garage, Tomotaka Takahashi, is one of the youngest researchers in the field of robotics. Inspired by anime such as Ironman No. 28 and Mighty Atom, Takahashi began building robots. Takahashi is known for his friendly yet sophisticated designs that allow his robots to move and interact more naturally than other robots.

COURTESY: ROBO-GARAGE

About the Program

Author of *Loving the Machine: The Art and Science of Japanese Robots*, **Tim Hornyak** takes students on a historical journey detailing the rise of robots in Japan during this discussion and demonstration program. Students will take a virtual tour of the robot exhibition, a part of *JAPAN! culture + hyperculture* at the Kennedy Center, featuring some of Japan's most popular robots. Students also meet two researchers in the field of robotics: Professor Hiroshi Ishiguro and Robo Garage's Tomotaka Takahashi.

GREGORY MCCARTNEY

Instructional Activity

The Future of Robots

For the Japanese, robots are a part of everyday life and have become essential to the country's well being. Imagine yourself living among robots like the Japanese. How could robots be integrated in your daily routine? What types of roles could robots play at school, at home? Now, think about how the integration of robots would impact the country economically, technologically, and socially. After discussing with classmates, write an essay about the integration of robots and include solutions for dealing with and preparing for both the positive and negative impacts of robots in the future.

Resources

Internet

For more information, connect to:

Paro
paro.jp/english/index.html

Robo Garage
robo-garage.com/english/index.html

Aibo
support.sony-europe.com/aibo/

Loving the Machine
lovingthemachine.com

Wakamauru
mhi.co.jp/kobe/wakamaru/english/

Karakuri
karakuri.info

kennedy-center.org.pwtv

Print

Hornyak, Timothy. *Loving the Machine*. (Kodansha International, Ltd., 2006).
Jefferies, David. *Artificial Intelligence: Robotics and Machine Evolution*. (Crabtree, 1999).

COURTESY: HONDA MOTOR

JAPAN!
CULTURE + HYPER CULTURE