Reinventing
ROBOTICS

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# Table of Contents
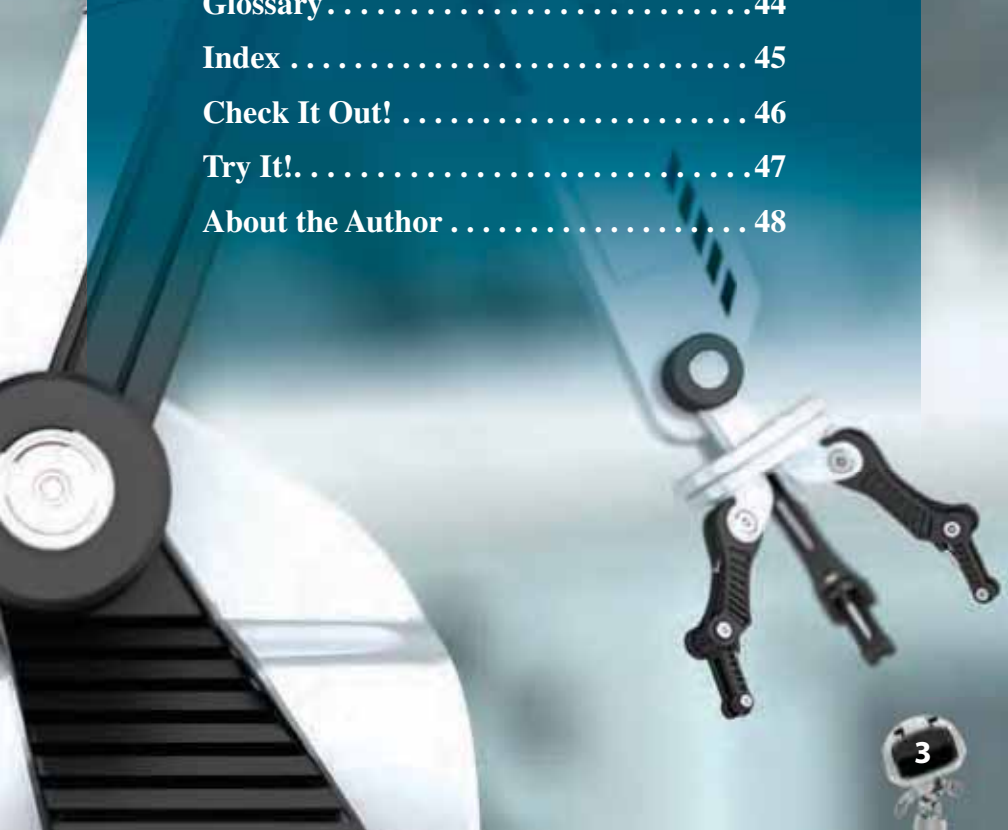
The Robotics Age

Robots are no longer the dream of a distant future. State-of-the-art robots have arrived. There are bots that fly, swim, talk, walk, and even drive. Engineering teams around the world are busy building more sophisticated machines. You can join this team of innovators.

There are thousands of ways to pursue a career in **robotics**. Some **engineers** design bots that are faster and stronger than humans. Others research **androids** that interpret and enhance how humans communicate. Some build robots for mass entertainment—mechanized toys we buy in stores and see on the big screens.

No matter your technology talents, you will find that robotics is a team sport. Designers, engineers, and **programmers**, whether they work in movies or medicine, collaborate to bring their robotic designs to life.

Coining the Term

Science fiction author Isaac Asimov coined the term *robotics* in the 1940s. He was interested in the idea of **artificial** intelligence and featured many robots in his work.

I, ROBOT
ASIMOV

panther science fiction
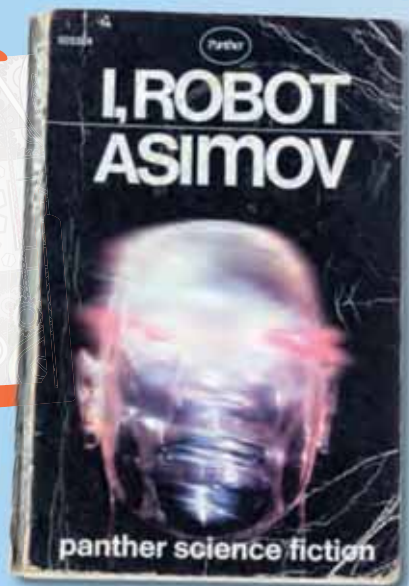
THINK LINK

- What do you know about the history of robotics and robots from the past?

- How do robots affect daily life today?

- How would the world change if we no longer had computers, which robots rely on to operate?

A Brief History of Bots

Robots are not recent inventions. People have been building machines for centuries. Before we tour the bots of today, let's analyze some of their most primitive **prototypes**.

In the 1500s, Leonardo da Vinci designed a mechanical lion for the king of France. Two hundred years later, Jacques de Vaucanson, a French inventor and artist, built a robotic duck. The mechanical duck appeared to eat and digest grain. These early bots were far ahead of their time. Remember, it wasn't until the twentieth century that the word *robotics* was invented!

Leonardo3 Museum

Leonardo3, a research center in Milan, Italy, currently builds full-scale models of da Vinci's inventions, including his famous flying machines. Some of their exhibitions include little-known designs that are being built for the first time.

Ancient Androids

One of da Vinci's best-known inventions was a **humanoid** robot that resembled a fifteenth century knight. According to his notebooks, da Vinci's bot could sit up, move its head and arms, and open and close its visor.

The Original Roboticist

Leonardo da Vinci was a painter, mathematician, and scientist. He was also a **roboticist** and a **visionary**. Da Vinci supported blending fields of study. He viewed science as one of the fine arts.

Da Vinci's notebooks were filled with ideas and inventions that would not be fully realized until centuries after his death. Today, scientists and engineers are still mining his manuscripts for new ideas.

The Rise of Industrial Robots

Henry Ford founded the Ford Motor Company in 1903. He is famous for developing the moving-chassis assembly line. Initially, Ford used rope and pulley **conveyor belts** to move an automobile's frame down the assembly line. Later, a mechanized conveyor belt sped up the Model T's rate of production.

Before Ford's invention, it took workers 12 hours to build a single car. By 1914, one Model T could be assembled in about 90 minutes. This moving-chassis assembly line allowed the Ford Motor Company to make cars faster and cheaper than they were before. Eventually, cars became less expensive. More people could enjoy the benefits of travel by car.

Most **industrial** robots have been engineered to speed up production. In 1961, Unimate was designed for General Motors. It was used as a welding machine. The robot also took on the dangerous job of extracting **die-casts**. Robots often do tasks that are thought to be too dirty or unsafe for humans.

Curiosity Rover

NASA's *Curiosity Rover* is searching for signs of life on Mars. The car-size robot is collecting samples of sand and monitoring Martian winds.

Bots of the Space Race

In 1957, the Union of Soviet Socialist Republics (U.S.S.R.) launched the first **orbiting** satellite. The satellite, called *Sputnik*, started a "space race" between the U.S.S.R. and the United States. This competition greatly fueled robotics innovations.

Reader's Guide

1. What are the problems involved in creating a humanoid, or robot that resembles a human?

2. How might autonomous vehicles be beneficial or harmful for teen drivers?

3. Think about some traits humans possess. Do you think these traits can be replaced by robots? Why or why not?

4. What are four different areas in which a robotics engineer could apply his or her knowledge?