



# Lesson 1: What is a Robot?

## **By the end of this lesson, you will be able to:**

- Provide a clear definition of a robot.
- Describe the various applications of robots.
- Give examples of how robots can be used in everyday life.



# Introduction

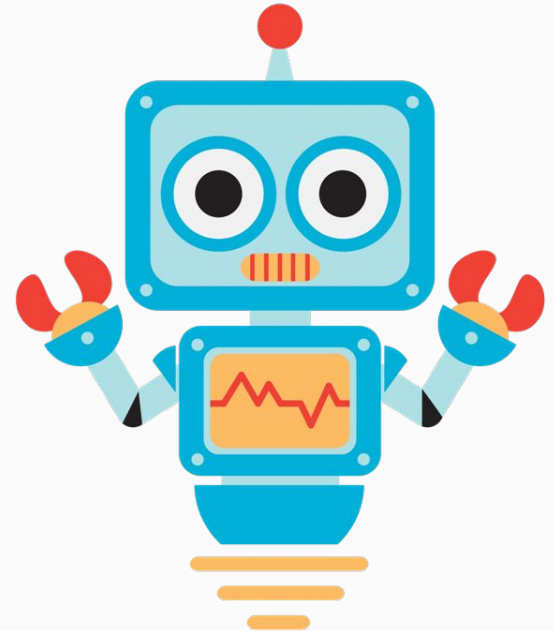
Welcome to the Robits curriculum package! We hope you'll enjoy this course and develop a new passion for robotics along the way. In this lesson, you'll primarily learn a basic definition for what a robot is. You'll also explore several examples of robots that are used in industry and everyday life. Robots are very versatile machines, and they can be used in many different ways. Let's get ready to explore!



**What is a robot?**

# What is a robot?

A robot is a programmable, autonomous or semi-autonomous machine, composed of mechanical systems, electrical systems, and software, that can perform tasks or manipulate objects in the physical world.







**What are some applications  
of robots?**

# Applications of Robots:

Robots can be used to complete a wide variety of tasks, making life easier for humans. They are often used throughout everyday life, acting as virtual assistants, cleanup crews, and deliverymen. Not only that, but robots are employed in a variety of fields, including manufacturing, healthcare, and aeronautics, where they are used to complete more complex, specialized tasks.



Boston Dynamics' robot dog, "Spot," opening a door.



**What are some examples of robots used in everyday life?**



# Domestic Robots

Robots are often used domestically in homes and workplaces to perform a variety of tasks. These tasks can include cleaning, laundry, and personal care. Examples of domestic robots include iRobot's Roomba and Polaris robotic pool cleaners.



iRobot's Roomba automatic vacuum.

## Recreation

Robots are used for recreational purposes nearly as often as they're used to fill jobs. Many people find great joy in flying drones, and countless children's toys incorporate robotics or are robots themselves.



A drone being flown through the air.

# Virtual Assistants

Though not conventional robots, virtual assistants have the capability to do many different things. They can help people navigate, keep track of time, hold onto lists, and so much more. Examples of virtual assistants include Apple's Siri, Microsoft's Cortana, and Amazon's Alexa.



Amazon's Echo, the device used to interact with Amazon's Alexa.





# Discussion:

**With the people around you,  
discuss where you've seen robots  
used in your life.**



**What are some examples of  
specialized robots?**



# Manufacturing

The ability to perform the same repetitive task over and over makes robots a great asset to the manufacturing industry, where goods need to be produced on repeat without differing in quality. Robots bring automation to the assembly line, and can cut, weld, and inspect a variety of different products.



Robots working on assembly line manufacturing cars.

# Healthcare

Robots are a critical part of the healthcare industry. Not only can they perform operations that are too difficult or precise for humans, but they are also impervious to diseases, making them the ideal caregivers. They are used to perform surgery, provide personal care, and conduct disinfection.

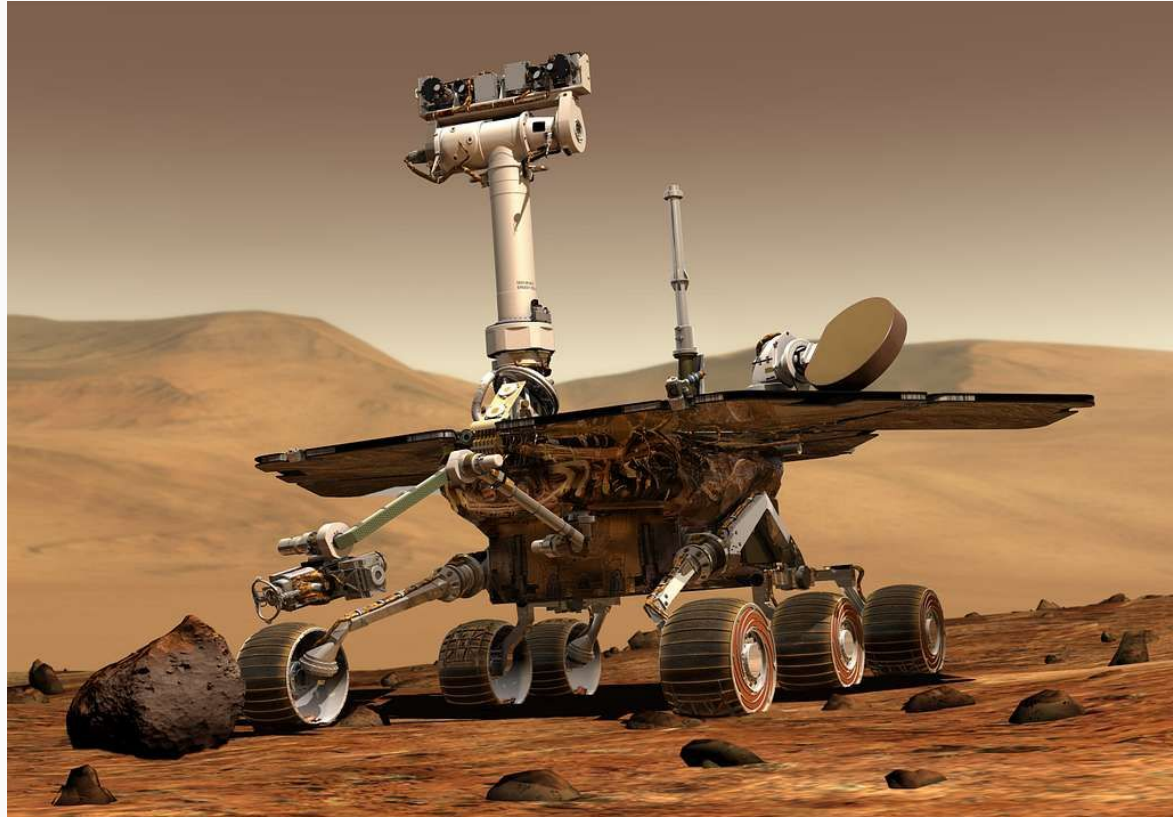


A DaVinci Surgical Robot being used in the operating room.



# Aerospace

Space travel is risky and expensive, but using robots to explore space in our stead can greatly decrease costs, and prevents the loss of human life. Companies like NASA and SpaceX often use robots, such as rovers or satellites, to further humanity's knowledge of space.



NASA's Opportunity Rover on Mars.

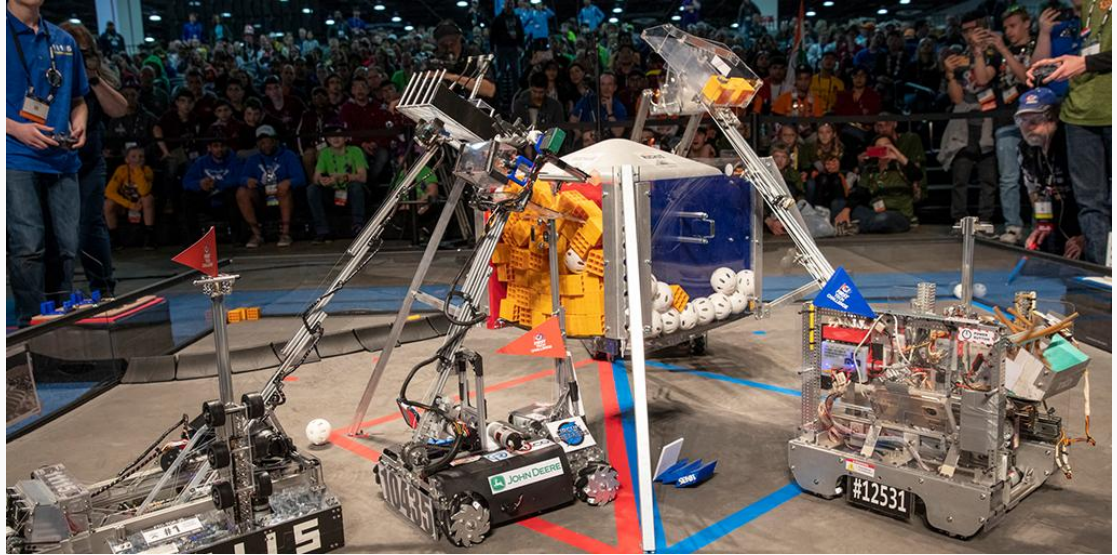


**Where else can robots be  
used?**



# Competition

Robotics competitions are a great place to showcase robots. Like most sports, these competitions are based around a game, where players must achieve specific goals. Robots are then built with these goals in mind. Examples of organizations that hold robotics competitions include BattleBots, FIRST, RECF, BEST, WRO, Botball, and NHRL.

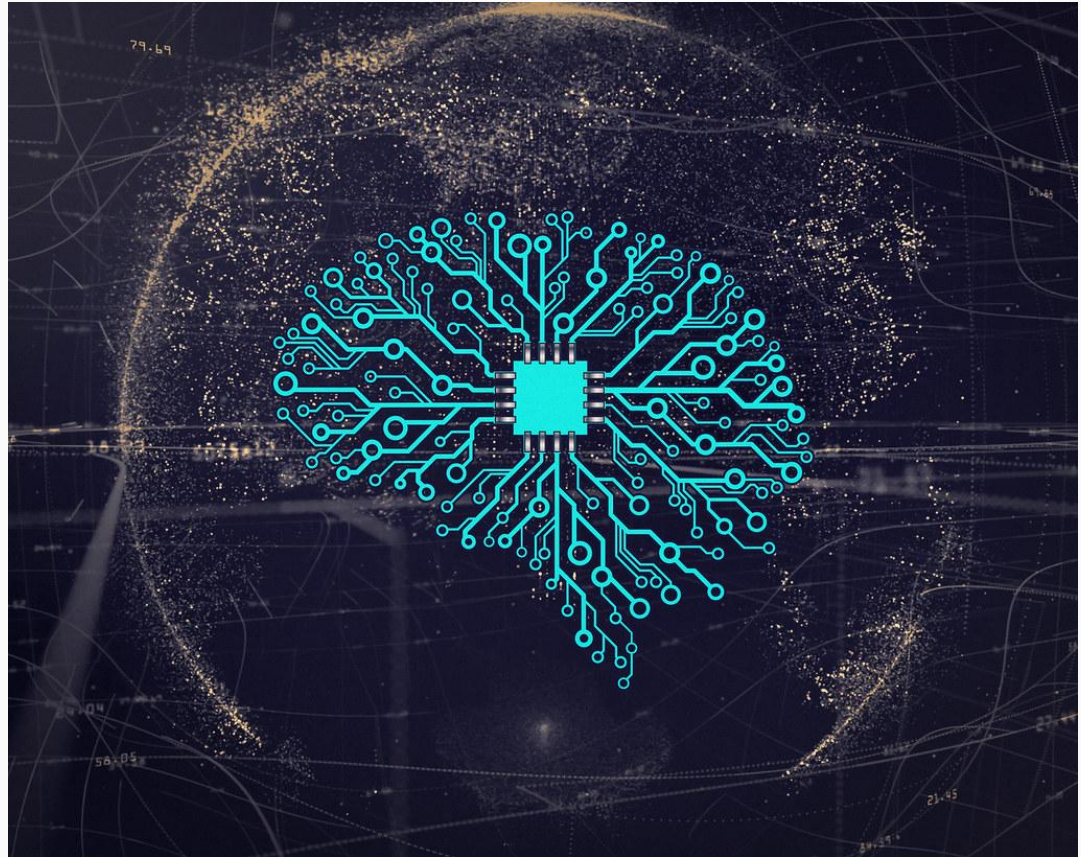


Robots competing in a FIRST robotics competition.



# Artificial Intelligence

While technically not a robot, artificial intelligence (AI) incorporates the principles of robotics. AI can be used in robots and has become very prevalent in today's society. It is capable of doing a wide variety of different things, ranging from pattern recognition to art generation. In robots, AI can be used to analyze massive amounts of data taken from sensors and can enable robots to use computer vision to navigate and detect objects.



A conceptual image of artificial intelligence.



**What are some careers in  
robotics?**

# Careers in Robotics:

- Robotics Engineer
- Aerospace Engineer
- Computer Scientist
- Mechanical Engineer
- Design Engineer
- Robotics Technician
- Hardware Engineer
- Software Engineer
- Mechatronics Engineer
- Research in Robotics
- Sales Engineer
- User Interface Designer





**Let's look at what robots are  
made of in Lesson 2!**

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