ROBOTS 101

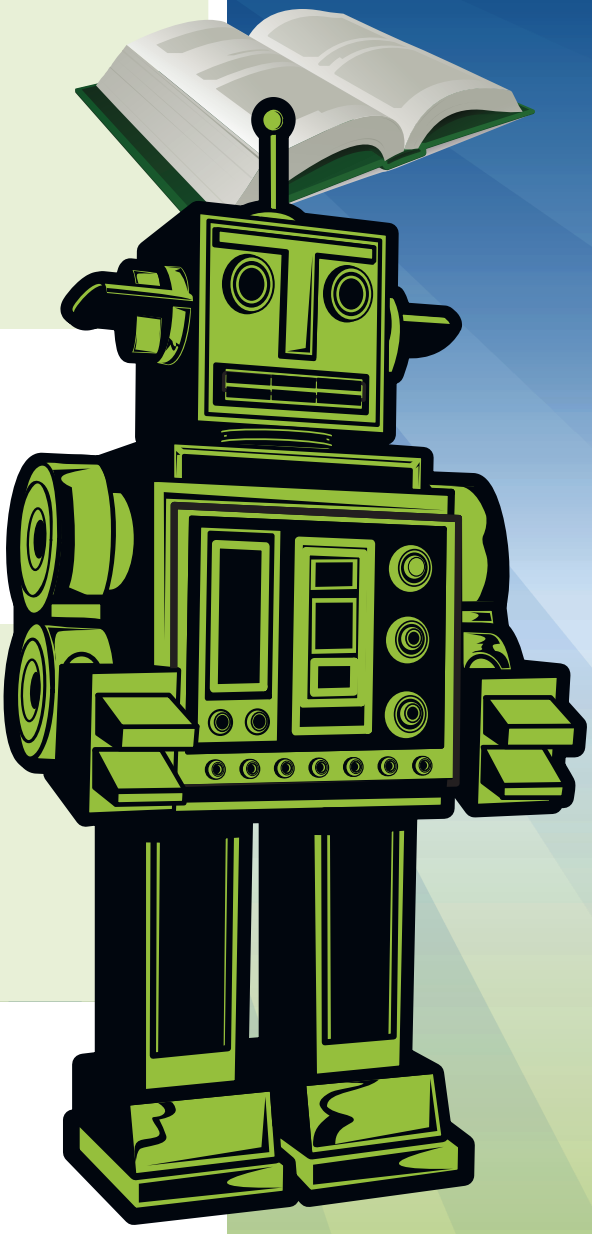
What is a robot?

At its most basic a robot is a machine that senses the world, processes the sensor information with a computer and then does something in response to that information (such as moving or turning).

A robot isn't just a computer. A desktop computer can "sense" that you are typing or moving the mouse, but the computer itself doesn't move or act in the physical world.

Where can I find a robot?

Many everyday objects around you are a lot like robots. A car with cruise control senses how fast the car is moving and then changes the car's acceleration so that the car's speed stays constant. A thermostat in a room senses what temperature the room is and then it turns on a heater or air conditioner to bring the room to the right temperature.



Many people assume all robots are characters in science-fiction movies like the Terminator or R2D2 in Star Wars. In fact, robots are used all over the world, right now! Robots build cars, clean houses, help soldiers and doctors, are played with by kids and explore other planets. They may not look like the robots we see in the movies but they are still doing important jobs. Robots can also be very powerful tools for learning. Kids all over the United States are using robots in their classrooms and out-of-school to help them learn science, technology, engineering, and math (STEM) topics in new and innovative ways.

How do robots learn about the world around them?

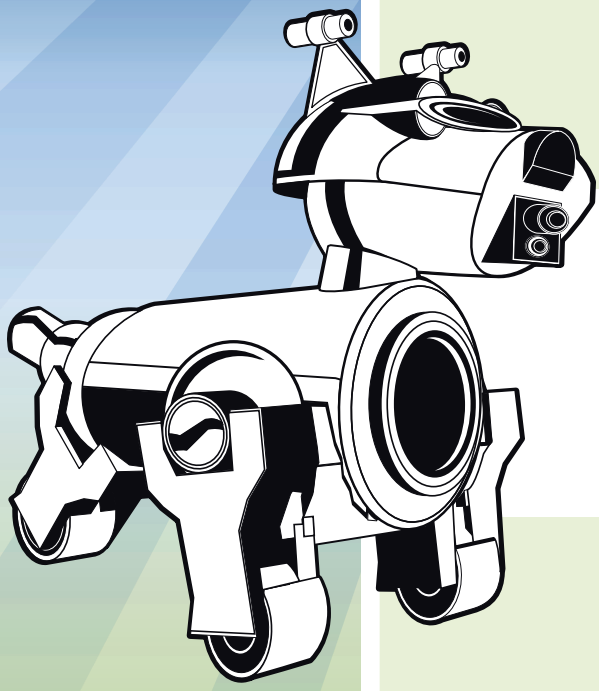
Robots are often equipped with a variety of sensors that allow them to collect information about their environment. Depending on its task, a robot might have a wide variety of sensors. Some of the most common sensors that robots use include:

- Cameras to find objects, people, or other robots
- Global Positioning System (GPS) receivers to determine the robot's location
- Laser rangefinders to determine the distance between the robot and other objects
- Light sensors to detect how bright the robot's environment is
- Temperature sensors to detect how hot or cold the robot's environment is
- Touch sensors to tell the robot if it has bumped into something

Who makes robots?

Robotics is a multi-disciplinary field; it takes a lot of different expertise to design, build and program a robot. Often mechanical engineers, electrical engineers, computer scientists, industrial engineers and industrial designers are all involved.

Mechanical engineers design all of the physical parts of the robot – parts like the chassis, motors, arms and hands, wheels, tracks or legs. Electrical engineers design all of the circuits and wiring that the internal computer will use to control the robot. Computer scientists program the robot; they write the software that takes the information from the robot's sensors, processes it and then tells the robot how to act. For robots that are mass-produced, industrial engineers are needed to figure out how a factory can make all of the robot's parts and in what order they should be put together. Industrial designers look at all the different parts of the robot and figure out how it will look on the outside – what color will its chassis be? Where should the company logo go?



What does the future hold for robotics?

In the future robots may be used to help doctors examine patients who are far away, to help carry injured people out of disaster areas, to assist senior citizens or people with disabilities or even to inspect bridges for signs of wear. Scientists and engineers all over the world are developing robots that can help people in homes or outside, on land, in the water and in the air. Keep your eyes open and watch for these amazing robots!

Robots 101 is brought to you by iRobot SPARK in celebration of National Robotics Week.

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