

**AUDIO SCRIPT**

**[Passage 1 – M1: Male Interviewer; F1: Female Interviewee]**

M1: Good morning, listeners. Welcome to the Technology Show. My guest today is Dr. Gretchen Sanders, a robotics engineer, who will give a presentation at the annual Robotics Convention later this week. Thanks for coming in, Gretchen.

F1: It's a pleasure to be here, Kyle.

M1: Could you explain what a robotics engineer does?

F1: Well, a robotics engineer is really a designer. We design robots that can perform tasks that humans are either unable to do or prefer not to do. We aim to make jobs safer, easier, and more efficient.

M1: So, when was robotic technology invented?

F1: There is no particular date that robotic technology started because it evolved over a long period of time. We can go right back to 400 BCE when the ancient Greek mathematician Archytas constructed an artificial bird. The bird was made of wood and powered by steam. In the 13<sup>th</sup> century, the Arab engineer Al-Jazari designed several automatons, which are mechanical devices that can move and perform tasks. Al-Jazari actually published a text called *The Book of Knowledge of Ingenious Mechanical Devices*. Then, in the 15<sup>th</sup> century, Leonardo da Vinci sketched plans for a human-like robot. After the 17<sup>th</sup> century, the Japanese created their own automatons.

M1: Such as?

F1: Well, they made karakuri puppets. *Karakuri* means “mechanism” or “trick,” so they were designed to entertain people. Automatons were often displayed at public events. People loved to see them. In the 18<sup>th</sup> century, Swiss inventor Pierre Jaquet-Droz made some extraordinary automatons that consisted of thousands of moving parts. They still work perfectly today. So, these were the early prototypes for modern robots.

M1: Interesting. When did we first see 20<sup>th</sup>-century robots?

F1: Well, the word “robot” was first used in 1921 by the Czech playwright Karel Capek. But it wasn't until computer technology was invented that modern robots became a reality. The Artificial Intelligence Center, which was founded in 1966 and became part of the Stanford Research Institute, built a robot called Shakey. Shakey was the first intelligent robot that could make its own decisions about how to

behave. You could give Shakey instructions such as “move the block onto the table” and it would reason how to perform the task.

M1: That’s very impressive. What is artificial intelligence, exactly?

F1: Well, AI, as we call it, is a really exciting area. But building artificially intelligent robots isn’t like building an artificial heart. Intelligence is more complex and mysterious than a body organ. We’re still learning about how and why humans think the way they do. Robots have a limited capacity to think and learn, and they can’t process complex information like humans can. So while some robots are similar to humans, they will always be fundamentally different.

M1: What are the benefits of robotic technology?

F1: Right now, there are exciting developments in the medical field—for instance, robotic surgery. These robots assist surgeons in performing operations with minimal errors. The robot can often access hard-to-reach locations in the human body with more flexibility than a surgeon’s hands.

M1: Really? Well, I’m afraid that’s all we have time for today. Thanks, Gretchen.

F1: You’re welcome, Kyle.

**[Passage 2 – M1: Male Student; F1: Female Student]**

M1: Hi, Erica. Are you ready to practice our presentation?

F1: Sure, Max. I think I have all the information. I’ve organized our notes into three main ideas. One: I’ll give an overview of the topic. Two: You’ll describe the problem of dumping e-waste in developing countries. And three: We’ll make recommendations for the proper disposal of e-waste. Should I begin?

M1: Sure. Go ahead.

F1: Okay. Good morning, everyone. Max and I are going to talk about e-waste disposal. E-waste refers to electronic devices such as phones, computers, and TVs that people dispose of, or throw away. The United States is the world leader in producing e-waste. It throws away about 3 million tons each year. Next is China, which produces about 2.3 million tons. Electronic devices contain toxic metals such as lead, cadmium, and mercury ...

M1: Should we define “toxic”?

## Inside Listening and Speaking 1

### Final Assessment

## INSIDE LISTENING AND SPEAKING 1

F1: Okay, “toxic” means poisonous, or very dangerous to people’s health. Now, many people aren’t aware that electronic devices contain gold, silver, and copper. 100,000 cell phones contain about \$130,000 worth of gold, \$100,000 worth of copper, and \$27,000 worth of silver. So, that’s why a lot of developing countries accept e-waste. People can make money breaking up the devices and selling the parts. Sadly, many young children do this work. Some countries have banned dumping e-waste in developing countries, but it still happens. Your turn, Max.

M1: Okay. A lot of this e-waste goes to Ghana, a country in West Africa. Ghana imports more than 200,000 tons of e-waste. This has caused terrible pollution problems. A Ghanaian researcher named Atiemo Sampson tested the soil near a school, a church, a soccer field, and a market, all located near an e-waste site. He found that toxic metal levels were nearly 50 times higher than in other areas. Some of these toxins get into the soil and sometimes they enter the water source. When e-waste is burned, toxins pollute the air. Sampson says it’s hard to end the e-waste recycling industry because it generates income for so many families. Plus, there is no alternative employment for these people. A group called StEP, which stands for Stop the e-Waste Problem, recommends that the recycling process be changed. The group thinks people should still be able to work at the sites, but in a way that is safe for them and the environment. E-waste recycling plants are a possible solution, but they are expensive to build and a low priority in poor countries. Back to you, Erica.

F1: There are other countries besides Ghana, aren’t there?

M1: Er, yes, China is the largest e-waste recycler, then India, Nigeria, Ghana, Cote D’Ivoire, Benin, and Liberia. But I think we should focus on one country because we’ve only got 15 minutes.

F1: Okay. So, obviously, we should dispose of our e-waste properly. Never throw old devices in the trash. They’ll end up in landfills and pollute the soil, water, and air. There are other options. First, some stores accept old devices for recycling. You can search online for the nearest location. Second, donate your old device to a family member or a charity. Third, turn it into a piece of art! Check out Computer Part Art, a creative new genre. Thanks, everyone.