mystery science

Grades K-5
Mini-Lesson: “How does AI work?”

VIDEO TRANSCRIPT

VIDEO 1

Hey, it's Esther. My friend took this video while riding in a car. Watch the steering wheel turn and see if you notice something strange. There's no one driving. This is what is sometimes called a self-driving car. Instead of a person driving, the car is controlled by a computer system with artificial intelligence. You've probably heard about artificial intelligence, or AI. Like, maybe you've heard that AI can chat with you online. You type a question, and it answers. Or maybe you've heard that AI can make pictures, like this AI image of a made-up animal. Someone named De'Mari is curious about AI. Let's give De'Mari a call now.

[Video Call]

- Hi, Esther.
- Hey, De’Mari.
- I have a question for you. How does AI work?
- That's a great question.

AI is changing so fast that we can't cover everything in one video. I just mentioned a few things that AI can do today: drive cars, chat, and make pictures. These things are really different. You might wonder how AI does them all, but if I told you my *friend* could do all these things, that wouldn't be so surprising. People can learn to do different things, and learning is a big part of

how AI works. So let's start with some ways that you learn, like how this baby is learning. They're making a mess, but watch closely. What do you think this baby is learning?

VIDEO 2

Maybe you guessed that this baby is learning to feed themselves. For any baby, it takes a lot of tries to get food in their mouth. They learn from what works and from what doesn't. Each time a baby tries something, their brain gathers information and starts to notice similarities or patterns. When a baby gets older, they can use what they learned from past experiences combined with what they're noticing now to figure out how to eat new foods. Now imagine if, instead of learning like this, you came up with step-by-step instructions for feeding yourself. Like step one, find food. Step two, pick up food. Step three, put food in mouth. But wait, how do you pick it up? A slice of pizza is not like tiny peas. And picking up soup? Totally different. Just think of other foods. You'd need specific instructions for each one. That might sound silly for a person, but step-by-step instructions are one way that computers work. People decide what they want a computer to do and come up with step-by-step instructions for the computer to follow. You may have heard this called *programming*. AI works differently. People still decide what they want the computer to do, but instead of step-by-step instructions, they come up with programming that helps a computer system learn to do a task. How that works gets really complicated and varies a lot. But one way is a bit like this messy learning. Similar to how a baby gets lots of experiences with food, an AI system is given lots of information. So an AI system designed to make images would get information in the form of pictures, photographs, drawings, all kinds of pictures. We're talking thousands and thousands. The system is programmed to find patterns in the information, like these pictures of cats. I see a pattern of having pointy ears and furry tails. The AI system can use patterns like these to make new images of cats. But at first, the

information is just a digital jumble, and the AI doesn't know what it's looking at. It's a bit like a baby making a mess with food. The program has to try over and over again, making messy mistakes and finding what works better. That's how the AI learns. Let's give the AI system a new task. Make a picture of a unicorn cat. It can use patterns it learns from pictures of cats and patterns it learns from pictures of unicorns to predict what's important to include for something that's part cat and part unicorn. Then it decides how to make a new image. Sometimes AI systems don't get things right. That's why AI systems are programmed to learn from what works and what doesn't in order to improve. Today, some AI systems are able to do complicated tasks like driving, and some can make images of things that seem real but aren't, like this one. Hummingbirds don't actually live inside tulips. This is an image made by AI. This photo was taken in the real world. That's a real hummingbird's nest. See how incredibly tiny it is? This photo and this AI image both seem real, but the AI one is not what happens in real life. That's why it's important to look up other kinds of information to learn more and check facts. So, in summary, AI systems do different things, but the basic way that they work is similar. Instead of following step-by-step instructions, AI systems work by learning. You learn from experiences and use what you learn to figure out how to do new tasks and make decisions. That's your intelligence. And your intelligence is the inspiration for artificial intelligence. Both you and AI systems learn from what works and from what doesn't work in order to get better at a task. AI is changing fast, and there's much more to explore. Along with impressive things AI can do, there are also big concerns, like how much energy and water are used to run AI. There's lots of debate about when to use AI and what kinds of tasks to use AI for. Since you're growing up in a world with AI, you can be part of figuring out how we use it in the future. It's good to remember that having AI do a task for you isn't the same as trying it yourself. Your brain still needs to learn

by doing things. That's part of your intelligence. So stay curious. That's all for this week's question. Thanks, De'Mari, for asking it.