LESSON 3

Future of robotics

20 minutes | Robotics Fundamentals

WHAT THIS LESSON DOES

In this lesson, we'll explore the exciting possibilities of the future of robotics. We'll learn about advancements in artificial intelligence, the promise of human-robot collaboration, and biologically inspired designs. We'll also consider the role of robots in space exploration and ethical considerations related to their use. By the end of the lesson, we'll have a better understanding of how robots will continue to transform the way we live and work in the future.

WHAT STUDENTS SHOULD BE ABLE TO DO

- Understand the role of AI in advancing robotics capabilities.
- Explore the potential of human-robot collaboration in daily tasks.
- Recognise the influence of biological systems on robot design.
- Appreciate the significance of robots in space exploration.
- Consider ethical implications of increasing robot integration into society.

BEFORE THE BELL

- No kit or accounts needed. This is a talk-and-think lesson. If you want students looking up examples, check that phone or device use is allowed in your room.

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HOW THE LESSON RUNS

Introduction
Exploring AI in Robotics
Human-robot collaboration
Biologically inspired robotics
Robots in space exploration
Ethical considerations
Wrap-up and Reflection

TEACHING MOVES

- 1. Introduction. Set the tone in one sentence: this lesson is about where robotics is heading, not how to build one today. Ask who has already seen a robot in real life or online.
- 2. Exploring AI in Robotics. Ask for examples of robots that learn or adapt, such as warehouse bots or self-driving features. Push the class: what decision is the robot making, and what data does it need?
- 3. Human-robot collaboration. Have each student name one daily task a robot could ease. Probe what the robot must sense, decide and do, and what the human still handles.
- 4. Biologically inspired robotics. Anchor the idea with one clear pair: cheetah legs for speed, spider legs for rough ground. Ask what living thing they would copy for a robot that must climb stairs.
- 5. Robots in space exploration. Ask why a robot goes first on Mars or the Moon. Collect answers on risk, distance and time, then link to sensors gathering data humans cannot reach.
- 6. Ethical considerations. Put three questions on the board: jobs, privacy, misuse. Give pairs two minutes on one question, then take one strong point from each pair.
- 7. Wrap-up and Reflection. Ask aloud: one opportunity and one challenge they foresee. Keep it spoken; do not collect written answers. Close on the idea that design choices carry social weight.

WHAT TO WATCH FOR

- Students treat human-robot collaboration as robots fully replacing people. Reframe with their daily-task example: list what the human still decides and what the robot only assists with.
- Students assume AI means a robot understands or has opinions like a person. Say AI here means learning from data and adjusting behaviour. Ask what training data a hospital-helper robot would need.
- Students think biologically inspired robots are made from living tissue. Clarify that engineers copy movement or structure from nature in metal, plastic and code, not living parts.

DIFFERENTIATION

- Emerging: Give a concrete prompt bank: tidy a room, carry shopping, check a patient. Let them pick one and describe only what the robot would do first.
- Developing: Pair them to test their idea: one describes the robot, the other names what could go wrong without a human in the loop.
- Proficient: Ask them to pick one ethical tension (jobs, privacy or misuse) and argue both sides in under a minute to the class.