

iRobot

Recommended year group: Year 7

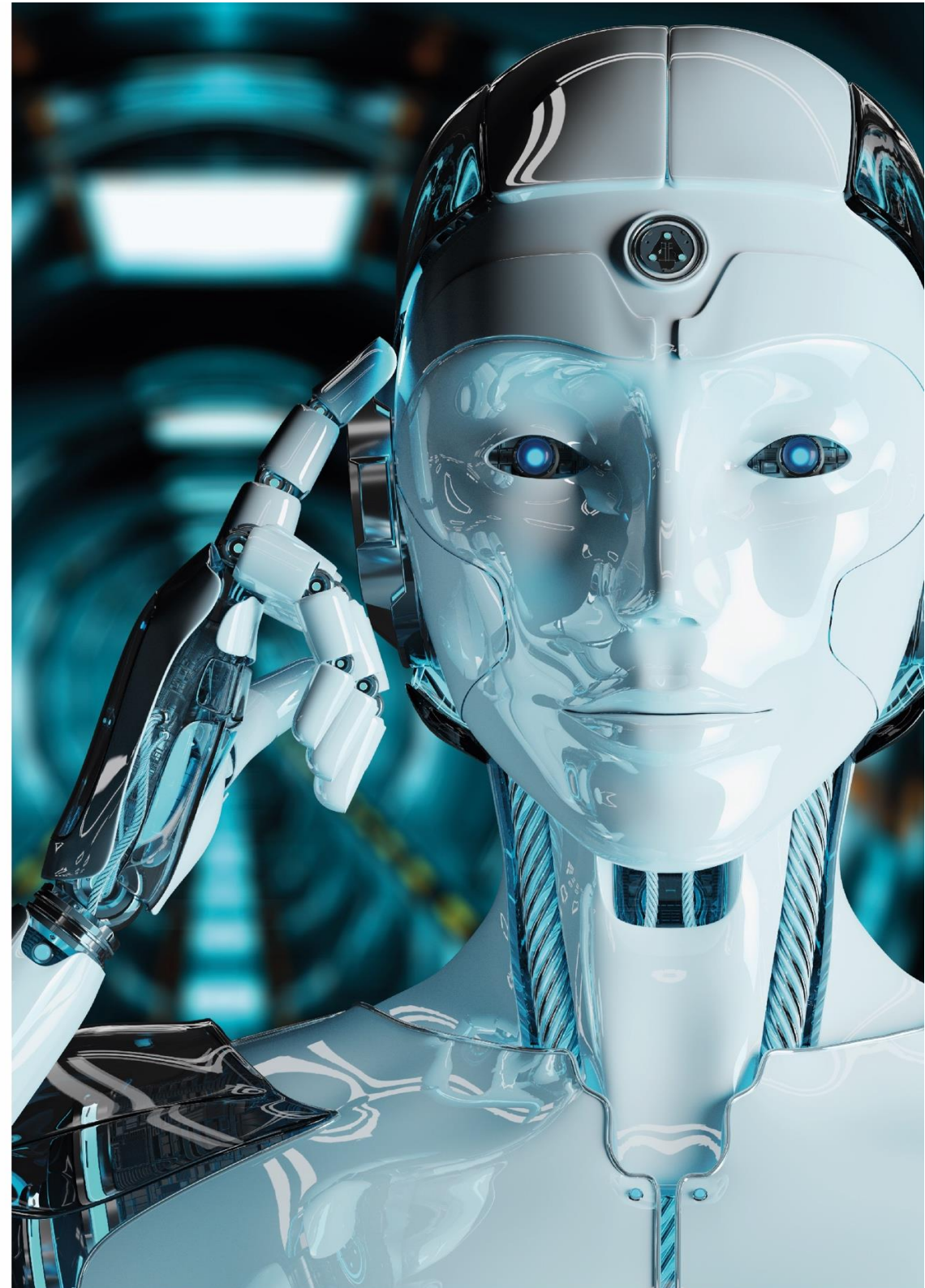
Subject focus: English, RE, PSHE, Computer Science

Driving Question

Could robots ever have the same rights as humans?

Introduction

In this theme students will consider both philosophical ideas and mathematical principles. iRobot connects two very different learning strands. The core of the theme, as suggested by the Driving Question, considers the future of robots from a socio-political point of view. In order to answer the driving question, students will first consider what it means to be human. Students will explore abstract concepts such as the soul, human rights and, to a certain extent, freedom. Underpinning the more philosophical ideas is the study of concrete concepts relating to the mechanics of both robots and humans. Students will explore programming by first considering key mathematical principles and relating these to control. By the end of this theme students will have a greater sense of the driving forces behind human ingenuity as well as a respect for the principles that underpin what it means to be human.



Assessment outcomes

Lesson 2: Electrical Circuits

Lesson 3: Electrical Safety and wiring a plug

Lesson 5: Life Processes and Prosthetics

Lesson 6: When can a robot become human

Lesson 8: Bicentennial man debate

Lesson 9 Big Write – is a robot just a robot

Lesson 10: Algorithms and choreography

Lesson 11: Big Read – Iron man

Key vocabulary

Algorithm, Amp, Amputee, Anatomy, Asimo, Asimov's Laws, Battery, Bicentennial, Binary, Characteristics, Code, Control, Current, Discursive essay, Earth, Electrons, Filament, First person, Fuse, Human, Humanity, Humanoid, Immortal, Impression, Kuka, Literary devices, Mechanical, Metaphors, Mortal, Muscular, Parallel circuit, Personification, Plug, Programmer, Prosthetic, Relationships, Religion, Religious beliefs, Repetition, Rhetorical questions, Rights, Robot, Robotics, Safety, Second person, Series circuit, Signal, Simile, Skeletal, Soul, System, Third person, Wiring

Linked reading

I, Robot by Isaac Asimov (1950)

I, Robot is a short story collection published in 1950 by Isaac Asimov. A collection of nine stories, the book explores the relationship between robots and humans in, what was at the time of publication, the not-too-distant future.

Flipped learning opportunities

Lesson 1 – What is a robot

Lesson 2 – Electrical Circuits

Lesson 7 – The Soul



People, Place and Time

The 'People, Place and Time' resources provide support to key knowledge throughout the theme. More specifically:

- **People:**
- **Place:**
- **Time:**

Family learning opportunities

Ideas for discussion at home:

Hodder Resources

Looking After Yourself

Read the following Kooth articles that link to the issues of this theme:

- Fake News
- Self esteem and body image
- The good side of gaming
- Link to a podcast here: [Gaming and Wellbeing by Kooth Podcast \(anchor.fm\)](#)

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Extended learning opportunities

Students could use these ideas to explore different features of the theme.

Careers

These ideas can be used alongside the lessons in order to discover career pathways associated with key elements of learning from this theme.

Explore careers in Computing and Technology

[Computing, technology and digital | Explore careers \(nationalcareers.service.gov.uk\)](#)

Explore careers in Robotics

[Robotics engineer | Explore careers | National Careers Service](#)

Places to visit

This section offers a selection of virtual trips which support knowledge of key areas and attractions from the lessons

[Thinktank | Birmingham Museums](#)

Clubs

Set up or join a robotics or coding club at your school

Cultural capital suggestions

Read: *I, Robot* by Isaac Asimov (1950)

I, Robot is a short story collection published in 1950 by Isaac Asimov. A collection of nine stories, the book explores the relationship between robots and humans in, what was at the time of publication, the not-too-distant future.

Look: *Wall -E*

This film depicts a dystopian future in which two robots have to try and save the last living plant from planet earth

Listen: *Automatica – Robots vs Music-* Nigel Stanford

This song is created using robotics manufactured by Kuka a major robotics company focusing on the industrial sector to make music

Lessons

Lesson title	Subject	Essential knowledge/concepts	Competencies	National curriculum coverage
Lesson 1: What is a Robot?	Science/ History	<p>Identify the key characteristics of a robot with reference to their applications.</p> <p>Research and discuss how robotics have changed our lives within a particular field.</p> <p>Explain the impact of robots in our future lives.</p>	<p>SC.CS.01: Using Scientific Ideas.</p> <p>SE.HS.02 Making historical connections</p>	<p>KS3 Computer Science:</p> <p>understand a range of ways to use technology safely, respectfully, responsibly and securely</p>
Lesson 2 Electrical circuits	Science	<p>Recognise components in a circuit and describe their functions</p> <p>Draw and understand series and parallel circuits</p> <p>Describe conductors and insulators and give examples</p>	*SC.CS.01 Using Scientific Ideas	<p>KS3 Science:</p> <p>electric current, measured in amperes, in circuits, series and parallel circuits, currents add where branches meet and current as flow of charge</p>

Lesson 3: Electrical Safety and Wiring a Plug	Science	Understand the importance of electrical safety Describe the purpose of a fuse. Describe the different parts of a plug.	*SC.PL.01: Asking scientific questions: Formulate a hypothesis which can be investigated in order to explain scientific phenomenon.	KS3 Science electric current, measured in amperes, in circuits, series and parallel circuits, currents add where branches meet and current as flow of charge
Lesson 4: Coding	Computer Science	Outline the basics of code Discuss how coding works Produce your own code	TL.CS.01: Use logical reasoning to analyse, evaluate and employ algorithmic thinking.	KS3 Computer Science understand several key algorithms that reflect computational thinking [for example, ones for sorting and searching]; use logical reasoning to compare the utility of alternative algorithms for the same problem
Lesson 5: Life Proses and Prosthetics	Science	Explore life processes and make connections with the functions of a robot. Use key vocabulary to explain the impact robots can have on our lives. Develop research skills in order to record relevant information about the characteristics of a prosthetic limb. Develop creative solutions to medical problems.	SC.CS.02 Reviewing Theories	KS3 Science: the structure and functions of the human skeleton, to include support, protection, movement and making blood cells ♣ biomechanics – the interaction between skeleton and muscles, including the measurement of force exerted by different muscles the function of muscles and examples of antagonistic muscles.

<p>Lesson 6: IS a robot become Human</p>	<p>PHSE/ RE</p>	<p>Identify and explain key features of Asimov's Laws.</p> <p>Explain how to maintain positive relationships between robots and humans.</p> <p>Investigate the impact of robotics on self-esteem.</p>	<p>*PS.HL.04: Recognises how attitude, behaviour, and social choices affect one's personal well-being and self-esteem.</p>	<p>KS3 Citizenship NC:</p> <p>The precious liberties enjoyed by the citizens of the United Kingdom.</p> <p>The roles played by public institutions and voluntary groups in society, and the ways in which citizens work together to improve their communities.</p>
<p>Lesson 7: The Soul</p>	<p>RE</p>	<p>Analyse whether robots should have the same rights as humans.</p> <p>Summarise what different religions believe about the soul.</p> <p>Express an opinion about the soul.</p>	<p>SE.RE.04: Evaluate religious statements</p>	<p>NATRE</p> <p>Explore some of the ultimate questions that are raised by human life, making well-informed and reasoned personal responses and expressing insights that draw on a wide range of examples including the arts, media and philosophy</p>
<p>Lesson 8: Bicentennial man Debate</p>	<p>English</p>	<p>Describe the differences between humans and robots.</p> <p>Identify and explain the unique qualities possessed by humans.</p>	<p>*CL.SL.03: Develop and adapt speaking skills and strategies in formal and informal contexts (Speaking and presenting).</p>	<p>KS3 English:</p> <p>participating in formal debates and structured discussions, summarising and/or building on what has been said</p>

		Analyse whether robots should have the same rights as humans.		
Lesson 9: Big Write Is a Robot Just a robot	English	Use our knowledge of robots from previous lessons to formulate our ideas Learn how to structure a discursive essay Include arguments from both sides and our opinion	CL.WP.03: Organise and present whole texts effectively, sequencing and structuring ideas, information and events (Organisation)	KS3 English: Writing for a wide range of purposes and audiences including non-narrative text.
Lesson 10: Algorithms and Choreography	Computer science	Perform a dance routine by following an algorithm Devise an algorithm which will aid others to learn your choreography Perform and review work independently	*TL.CS.01: Use logical reasoning to analyse, evaluate and employ algorithmic thinking. *TL.CS.02: Design, write and evaluate programs.	KS3 Computer Science: understand several key algorithms that reflect computational thinking [for example, ones for sorting and searching]; use logical reasoning to compare the utility of alternative algorithms for the same problem
Lesson 11: Big read Iron Man	English	Identify and annotate language features of Hughes' written style. Analyse literary devices used. Employ literary techniques to write for a purpose.	*RL.LD.04: Identify and interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyse how they affect meaning or tone.	KS3 English: knowing how language, including figurative language, vocabulary choice, grammar, text structure and organisational features, presents meaning

<p>Lesson 12: Careers in Robotics</p>	<p>History P.S.H.E.</p>	<p>Identify and define the term modern day slavery.</p> <p>Compare and contrast modern slavery to slavery in the 1700's.</p>	<p>SE.HS.02: Making historical connections (change and continuity, cause and consequence, significance/ importance, similarity and difference)</p> <p>PS.SC.02: Demonstrates examples of diversity, empathy, and equality from one's own life experiences.</p>	<p>KS3 Citizenship NC:</p> <p>The precious liberties enjoyed by the citizens of the United Kingdom.</p> <p>The roles played by public institutions and voluntary groups in society, and the ways in which citizens work together to improve their communities.</p>
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