

Artificial Intelligence Lesson Plans Collection 2023

Key Stage Three

Identifiers

Phase	11-14
Year	Y7,8,9

Curriculum links

England: National Curriculum for Computing – KS3	<p>Design, use, and evaluate computational abstractions that model the state and behaviour of real-world problems and physical systems.</p> <p>Understand how instructions are stored and executed within a computer system; understand how data of various types (including text, sounds, and pictures) can be represented and manipulated digitally, in the form of binary digits.</p>
Wales: Digital Competence Framework	<p>Producing: I can suggest and make improvements that are relevant for audience and purpose, based on feedback and self-evaluation of my digital work.</p> <p>Data and Computational Thinking: I can detect and correct errors in algorithms. I can create a simple model or self-contained algorithm.</p>
Scotland: Curriculum for Excellence	<p>Technologies: Computing Science I am developing my understanding of information and can use an information model to describe particular aspects of a real world system.</p> <p>Technologies: Technological Developments in Society and Business I can evaluate the implications for individuals and societies of the ethical issues arising from technological developments.</p>

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Activity Guidance

<p>Outcome Criteria</p> <p>Child(ren) will be able to...</p>	<p>Understand how AI systems are trained</p> <p>Explore how AI systems can be biased by their training data</p> <p>Experiment with using AI to positively improve their work</p>
<p>Questions to ask</p>	<p>Starter: What do all these items have in common? What does “AI” stand for? What artificial intelligence do you interact with?</p> <p>Were there any situations where the systems didn’t identify your drawing correctly? Why do you think that happened?</p> <p>Main: How many inputs will make for the best output? Why might your machine not correctly identify those variables? What might the risks be with machine learning and AI? What could happen if AI was given incorrect, flawed or biased learning data?</p> <p>What difficulties, if any, did you encounter with the outputs of the image editing AI? Why might those issues with AI image editing have occurred?</p> <p>Wrap-up: Is it right to use AI to edit or create images? Can we trust AI outputs?</p>
<p>Activity Descriptor</p>	<p>Computers don't lie, but liars can compute</p> <p>Starter:</p> <p>Show images/list of various AI-based products/items and ask what they all have in common. Discuss how AI is used widely in the modern world – give examples children can relate to, i.e., Alexa, Siri, Netflix recommendations etc.</p> <p>Explain that AI is underpinned by machine learning and explain that is what the lesson will be focusing on. Highlight that AI is a generally misused term, that covers a wide range of systems using large amounts of data to provide a simulation of human thinking.</p> <p>If possible, invite students to play Quick, Draw! (quickdraw.withgoogle.com). It is better to play in pairs, taking turns. After playing highlight that this is an AI system that identifies your inputs and compares them to known</p>

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drawing of the object. In order to do this, the system needs to have analysed many different drawings of the same object. Were there any situations where the systems didn't identify your drawing correctly? Why do you think that happened?

Explain that these systems need data to provide responses to prompts; data comes in many forms and is 'fed' into the machine to provide a dataset for the machine to use. The more data the machine has on a topic, the more accurate the responses are likely to be.

Main:

Pupils will need access to internet-connected devices for the activity.

Using Google's [Teachable Machine](#), pupils create inputs to teach their machine and test the outputs. Have their machines learnt correctly? If not, ask the pupils to consider why – what might have impacted their outputs? Were their inputs accurate?

Discuss in partners what would happen if the machine had been taught something inaccurate.

Explain risks with teachable machines, which are what AI systems are built on. If the information they are taught at the start is inaccurate, or biased, then the responses the system gives will be wrong.

If time allows, pupils could go and use the Teachable Machine again and teach it incorrectly.

Allow students some time to explore the range of AI services available online, or with apps on devices (where permitted by school policy)

Some helpful services to share with students to get started:

[Photoeditor.ai](https://photoeditor.ai)

[Pixlr.com](https://pixlr.com)

Students could use selfies taken on school or personal devices to edit, or they could use images from the range of Royalty-free stock image sites such as: [Pexels](https://pexels.com) or [PixaBay](https://pixabay.com).

Wrap-Up:

Using [this article](#) as a prompt, debate the ethics of AI image enhancement.

Based on what pupils have learnt today, can we trust AI outputs? Using a continuum (either on paper, on the whiteboard or in-person) from “not at all” to “completely”, pupils to mark, place a post-it or stand where they believe to be true.

Emphasise that the quality, security and legality of the output of AI is not certain, because we cannot necessarily see all the learning data behind AI systems. Therefore, we cannot rely on AI output to be 100% accurate or truthful and should always ensure that we refer to a different source of information to verify the accuracy as they may not always be correct.

Additional activities:

You could explore AI in the wider curriculum too:

- Art/English - [DALL·E 2 \(openai.com\)](https://openai.com) - requires a login, Dall-E is an AI system that can create realistic images and art from a description in words.
- English - [TextFX](#) - AI-powered tools for rappers, writers and wordsmiths – take a keyword and the AI will spin-off related alliterative words, similes, provide phrases to describe scenes, etc. There are 10 different tools to play with words in diverse ways. Could be used to support creative writing or enhance an existing piece of work.
- Music - [AI Music Generator - SOUNDRAW](#) - Choose the mood, the genre and the length of the music, and the AI will compose a range of pieces for you. Perhaps play a video clip and ask children to create a

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	<p>suitable soundtrack. Each track is divided into short sections of around 10 seconds, and users can move these around to create their own pieces to suit.</p> <ul style="list-style-type: none"> • History – Research and write about the timeline of key moments in the history of AI • Modern Foreign Languages - Thing Translator (thing-translator.appspot.com) - point your device's camera at an object and the AI will recognise the object and provide a translation into any one of a wide range of languages.
Activity Resource	<p>Tablets/Laptops Slide Deck Images saved on devices for pupils to edit (if being prepared by teacher beforehand) Article (from Washington Post) – could be printed out or opened on pupil laptops/tablets if more suitable than sharing on whiteboard.</p>

Suggested adjustments for those with additional needs

For the Teachable Machine activity:

Adults may wish to select whether images, poses or sounds would better suit these pupil(s), according to their needs.

Children could physically do this with toys or marbles, or other objects.

With adult support, take photographs as the training images and then child to physically sort images themselves (with support if required) using a decision tree.

For AI tools

Adults may wish to pre-select tools meeting the needs of their students.

Pre-download an AI app to use when editing images.

Pre-take or select suitable images for the students to edit using AI.

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