

AI Professional Learning: Intro to AI

SESSION OVERVIEW

DT Curriculum focus	Covered in the session	Resources
Impact and interactions	<p>What is AI?</p> <ul style="list-style-type: none"> • A useful starting point for students is to consider what they think AI is or isn't. • We consider what AI we might have used this week; this month. • We introduce a way of grouping AI by the tasks it is able to do. Does it see? Does it read? Does it speak? Does it hear? Does it move? • Use the Freyer diagram for students to describe what they think an AI is, they write their own definition, provide an example and a non-example. 	<p>Downloadable resources/links</p> <ul style="list-style-type: none"> • Freyer diagram • AI CARDS (PDF) <p>Lesson ideas</p> <ul style="list-style-type: none"> • Recognising AI (Years 5-6)
Digital systems and systems thinking	<p>AI can be described as a system</p> <ul style="list-style-type: none"> • Discuss AI as a system that has an input, a process and an output. • We use several examples to explain this approach including a set of cards and a Scratch computer game as a fun way for students to engage with the idea. 	<p>Downloadable resources/links</p> <ul style="list-style-type: none"> • Input-process-output cards • Scratch game <p>Lesson ideas</p> <ul style="list-style-type: none"> • Recognising AI (Years 5-6)
Data representation and interpretation	<p>Image recognition</p> <ul style="list-style-type: none"> • Many students will be familiar with image recognition and it is a useful starting point to learn about how an AI works. 	<p>Downloadable resources/links</p> <ul style="list-style-type: none"> • AI Tool: Cloud Vision API <p>Two applications of AI that solve problems</p> <ul style="list-style-type: none"> • Shark spotting:

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	<ul style="list-style-type: none"> We introduce confidence levels, an important AI concept. The AI predicts with a level of confidence. Sometimes an AI gets it wrong! We show image recognition in action and work out what the AI is doing. What input is required? What processing is done? What is the outcome? 	<ul style="list-style-type: none"> Weed spotting in Kakadu National Park
Data representation and interpretation	<p>Image recognition: Feature extraction</p> <ul style="list-style-type: none"> We look at how we can tell one object from another. We often do this by comparing each by their features, to do this we abstract. How does an AI do this? It requires abstraction: focusing on only the important information. Imagine creating an algorithm for someone to draw a shark. What instructions would you give? We compare the features of a shark and a dolphin. We test an AI Tool that is able to recognise what a user is drawing. Can it recognise the drawing of a shark? 	<p>Downloadable resources/links</p> <ul style="list-style-type: none"> AI tool: AutoDraw
Data representation and interpretation Computational thinking	<p>NOTE in DEEP DIVE 2 we explore further</p> <p>Image recognition: Patterns in data</p> <ul style="list-style-type: none"> We show how an AI using computer vision 'sees' by looking for patterns in data (pixels) or as shapes. Using an AI tool we test to see how well the AI recognises an image of a Kangaroo. We show how the image is made up of data (binary) indicating RGB coloured pixels. 	<p>Downloadable resources/links Covered in Deep Dive 2</p> <ul style="list-style-type: none"> AI sees shapes Pixel viewer <p>Lesson idea:</p> <ul style="list-style-type: none"> How can an AI recognise what it sees? <p>(Years 3-4)</p>
	<p>How machine learning makes image recognition possible</p> <ul style="list-style-type: none"> Machine Learning is a way to train an AI to complete a task. 	<p>Downloadable resources/links</p>

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	<ul style="list-style-type: none"> • Our explainer video can be used to find out about machine learning and the role it plays in an AI. 	<ul style="list-style-type: none"> • Artificial Intelligence Explainers: Video 1: Introduction to AI & machine learning
Algorithms and Implementation	<p>Creating an AI model</p> <ul style="list-style-type: none"> • We introduce an AI tool that we can use to create and test our own AI. • In our example we use the training of an AI to recognise a happy face and a sad face. • Students across F-6 can use this tool. • We discuss bias very simply using our AI model by showing the result of only having a limited data training set. • We demonstrate a way for students to evaluate their model using a star rating. 	<p>Downloadable resources/links</p> <ul style="list-style-type: none"> • Use this pre-made model to test the AI to see how well it recognises a happy or sad emoji. (You will need a device with a webcam and a sad emoji and a happy emoji printed on A4 page: see lesson idea below). • AI Tool: Teachable Machine <p>Lesson idea:</p> <ul style="list-style-type: none"> • Can an AI guess your emotion? (Years F-2)
Representation, algorithms and implementation	<p>Assessment opportunities</p> <ul style="list-style-type: none"> • We make connections to the curriculum in particular data representation, algorithms and implementation • We provide examples of how you could assess a student's skills, knowledge and processes. 	
Specification, Data representation and interpretation, Computational thinking	<p>Speech recognition</p> <ul style="list-style-type: none"> • We introduce NLP • Natural Language Processing (NLP) is the ability of machines to interpret and analyse forms of human communication, such as text and speech. • Using the programming of a virtual assistant we apply computational thinking: <ul style="list-style-type: none"> ○ Abstraction 	<p>Downloadable resources/links</p> <p>Lesson idea</p> <ul style="list-style-type: none"> • Home automation programming

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	<ul style="list-style-type: none"> ○ Problem decomposition: Break into smaller parts ○ Writing an algorithm: Order steps (written and as a flow chart) ○ Pattern recognition (look for patterns that repeat steps) ○ Modelling and simulation (show how to program using Scratch) ○ Evaluation (how well does it work?) 	
Implementation	<p>Scratch 3.0 and Speech blocks</p> <ul style="list-style-type: none"> • We show how a special version of Scratch has text recognition set of blocks that enables the inclusion of speech based on recognising text input. 	<p>Downloadable resources/links</p> <ul style="list-style-type: none"> • Text to speech blocks accessed in the additional blocks available in Scratch 3.0 project editor. <p>Desktop version</p> <ul style="list-style-type: none"> • https://scratch.mit.edu/download
Algorithms and implementation.	<p>Assessment opportunities</p> <ul style="list-style-type: none"> • Examples are provided showing ways to assess a student's skills, knowledge and processes of algorithms and implementation (relevant examples from F-2, Yrs 3-4 and Yrs 5-6) • We use the SAM (Supported, Acquired, Mastered) model where students can self-assess their learning. • Use think alouds (interviews where students explain their computer program and demonstrate it in action or talk through their algorithm.) 	<p>Downloadable resources/links</p>
Impact and interactions	<p>Ethical issues</p> <ul style="list-style-type: none"> • Systems that give rise to ethical issues such as those where a situation arises where there are competing alternatives and the right thing to do is not obvious or clear, are discussed. • We introduce Scenarios: drawing on ethical understanding using an AI Quiz. 	<p>Lesson idea:</p> <ul style="list-style-type: none"> • AI quiz (Years 5-6) <p>Lesson idea</p> <p>Systems thinking and AI applications (Years 5-6)</p>

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	<p>Making curriculum connections</p> <ul style="list-style-type: none">• What is your idea? Consider where you will include AI as part of your teaching and learning program.	
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