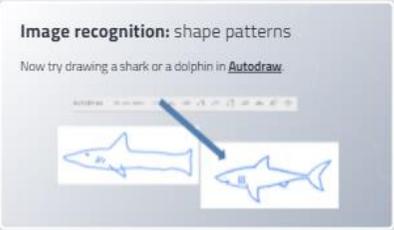# AI Professional Learning: Intro to AI
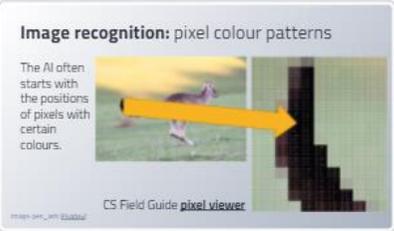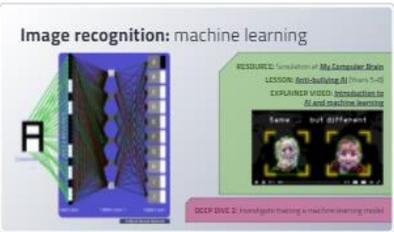
Session Overview

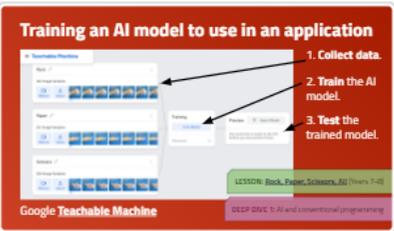| DT Curriculum focus	Section of the slide deck	Covered in the session	Resources
Digital Systems Impact and interactions Computational Thinking		What is AI? • We consider what AI we might have used this week; this month. • We clarify how the common applications for AI today are very different to the sci-fi conversation we were having in 1990s. • We explain the difference between traditional programming logic (IF/THEN) and training a Machine Learning model, and emphasise that both approaches still need data.	Downloadable resources/links • AI cards (PDF) • Artificial Intelligence Explainers: Video 2: AI in our everyday life Lesson ideas • Recognising AI (Years 7-8)

AI Professional Learning: Intro to AI

Data representation and interpretation		**Image recognition** • Many students will be familiar with image recognition and it is a useful starting point to learn about how an AI works. • 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?	Downloadable resources/links • [Shark spotting](#): • [Weed spotting in Kakadu National Park](#)
Data representation and interpretation Abstraction		**Image recognition: Feature extraction** • 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?	Downloadable resources/links • [AI tool: AutoDraw](#)

AI Professional Learning: Intro to AI

Data representation and interpretation Computational thinking		Image recognition: Patterns in data • 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.	Downloadable resources/links • AI Tool: Cloud Vision API • AI sees shapes • Pixel viewer
Digital Systems Data representation and interpretation		How machine learning makes image recognition possible • We use a simulator to illustrate what is happening inside a "computer brain" - a neural network - when it learns to recognise simple images. This concept is covered in more detail in the workshop **Deep Dive 2: Investigate training a machine learning model**. • Our explainer video can also be used to find out about machine learning and the role it plays in an AI.	Downloadable resources/links • Machine Learning simulation at MyComputerBrain • Artificial Intelligence Explainers: Video 1: Introduction to AI & machine learning
Algorithms and Implementation		Training an AI model to use in your own application • We introduce an online AI tool that we can use to create and test our own AI model for image recognition. • In our example we use the training of an AI to recognise a hand doing Rock, Paper or Scissors. • We discuss bias very simply using our AI model by showing the result of only having a limited data training set. • We show how the trained AI model can then be used within a JavaScript program students can	Downloadable resources/links • A pre-trained AI model to recognise rock, paper or scissors in front of a white background. • AI Tool: Teachable Machine

		code themselves, using an online environment. This process is covered in more detail in the workshop **Deep Dive 1: AI and conventional programming**.	Lesson idea: • Rock, Paper, Scissors, AI! (Years 7-8)
Systems thinking		Systems thinking • Seeing connections between solutions, systems and society • Investigate systems thinking using the Shark spotting AI drone; fill in missing elements to make sense of the flow chart. This concept is covered in more detail in the workshop **Deep Dive 4: AI: a context for Systems Thinking and Ethical Understanding**.	Downloadable resources/links • Little Ripper shark spotting drone. • Handouts (Fill in missing elements) Lesson idea • Systems thinking and AI applications (Years 7-10)

AI Professional Learning: Intro to AI

Specification
 	
Algorithms
 	
Implementation
 	
Computational thinking
		Speech recognition
		• We introduce Natural Language Processing (NLP), 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:
		   o Abstraction
		   o Problem decomposition: Break into smaller parts
		   o Pattern recognition (look for patterns that repeat steps)
		   o Writing an algorithm: Order steps (in flowchart and Pseudocode)
		• We show how to implement the program using JavaScript in the PencilCode environment.
		• Natural Language Processing is covered in more detail in the workshop **Deep Dive 3: Natural Language Processing for large text analysis**, which includes hands-on programming in Python instead of JavaScript.
			Downloadable resources/links
			• Speech listening commands accessed in JavaScript through the [PencilCode environment](#).
			
			Lesson idea
			• [Home automation: General Purpose Programming](#)

Impact and interactions		Ethical issues • 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. • This concept is covered in more detail in the workshop **Deep Dive 4: AI: a context for Systems Thinking and Ethical Understanding**.	Lesson ideas • [AI quiz](#) (Years 7-8) • [Analysis of AI applications, drawing on ethical understandings](#) (Years 7-8) • [AI Ethics - What's possible, probable and preferred?](#)

			(Years 9-10) • [Filter bubbles, bias, rabbit holes and nudging](#) (Years 9-10) Downloadable resources/links • Artificial Intelligence Explainers: [Video 3: AI Systems](#)
Data representation / Defining and decomposing problems / Algorithms / Implementation		We discuss various assessment options for: • understanding of AI and its connection to data representation, • algorithm design and code implementation • impact and ethics	

	Students' use of apps & tools **Think Aloud: Student interview** • Screen captures or saved program **Self-reflection** • What they learned, challenges, checklist/rating their skills before/after **Analysis** • Artefacts such as worksheets or analysis of AI tools, applications and real world uses. • Criteria used		
	Next steps Making a commitment to implementing AI in your classroom Use the chat to **write your idea** of where you will include AI as part of your teaching and learning program. Connecting and sharing with the group. email: digitaltechnologieshub@esa.edu.au	Making curriculum connections • What is your idea? Consider where you will include AI as part of your teaching and learning program.	