

REL8ABL
translator app

And a
slice of cake
please?

Language: English
Confidence: 99%

Natural
Language
Processing

Engaging in AI through project work

Jackie Child and Martin Richards



Location of participants

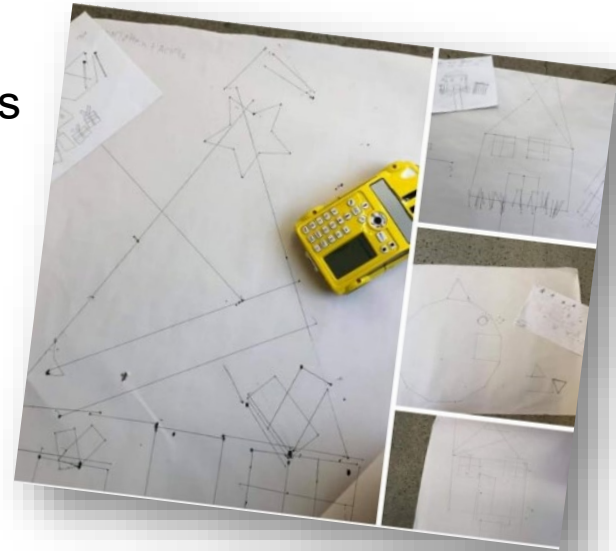


Acknowledgement



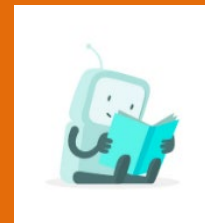
Meet Jackie Child ...

- Work with Junior School teachers to integrate Technologies across the curriculum.
- Upskill teachers in new and exciting technologies to enhance teaching.
- Maintain and equip two Makerspaces and a Coding & Robotics space.
- Teaching with teachers from Prep to Year 6.
- Teach Year 7 and Year 8 Technologies.
- Provide extra-curricular activities of Coding & Robotics Club, STEMies Club and TechMate Evenings.



Jackie Child: my learning journey of AI

- CSER MOOC Teaching AI in the Primary Classroom
- Resources on Digital Technologies Hub on AI
- Code.org resources on AI
- Articles and videos about AI for PD
- Books on AI for children (and adults)



AI for Oceans

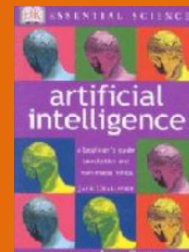
Learn about machine learning and ethical use of AI.

#CSforGood

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The Age of A.I.

2019 · Documentary · 1 season





What have you tried in your classroom: Artificial Intelligence?



Explore AI applications?

Lesson ideas?

AI videos?

Courses?

Or unsure where to start?

An intro to AI: What did my students know?

Students' prior knowledge of Artificial Intelligence was limited. Here's some examples:

"I know that AI is intelligence formed through people and brought out by robots. AI also allows non-living things to think through the intelligence of tech creators."

"AI is an abbreviation of Artificial Intelligence. The way AI works is that its code makes it respond according to your actions that you make on the device. Examples of AI are : Siri, cortana, ect... Although AI was made to copy humans that proved to be too difficult so instead it was made to mimic humans."

"I don't know anything about AI?? After i have watched the video about AI I know that it is an electronic device that is capable of preforming actions of human intelligence. Tries to mimic human behaviour."

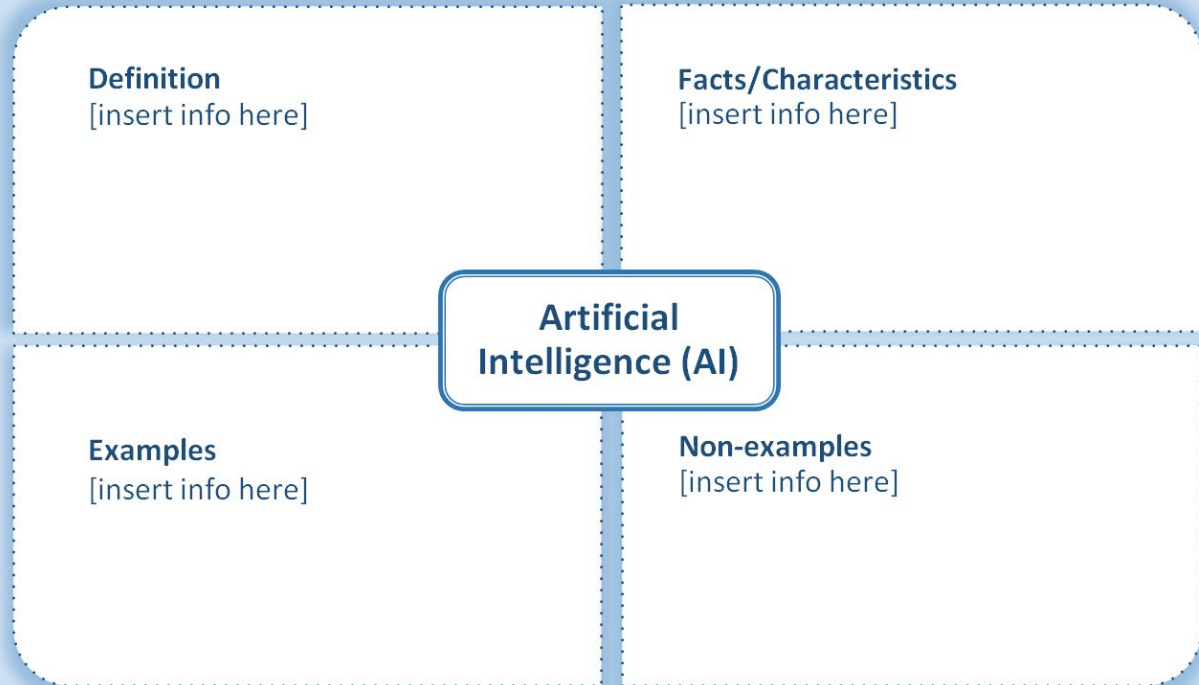
what i know about AI

I do not know anything about AI apart from AI stands for artificial intelligence, but I hope to learn more over the term.



Discover what your student's know

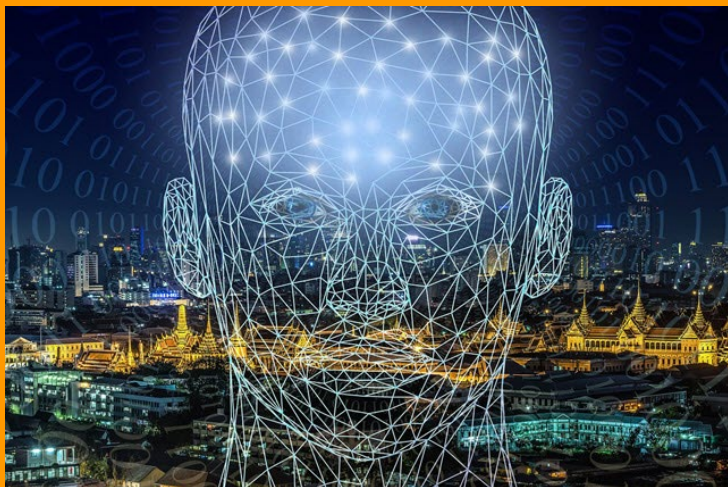
Frayer diagram



[Frayer diagram](#)



What is Artificial Intelligence?



The creation of machines to mimic human capabilities.

Teaching a machine to “see” (recognise objects in an image).

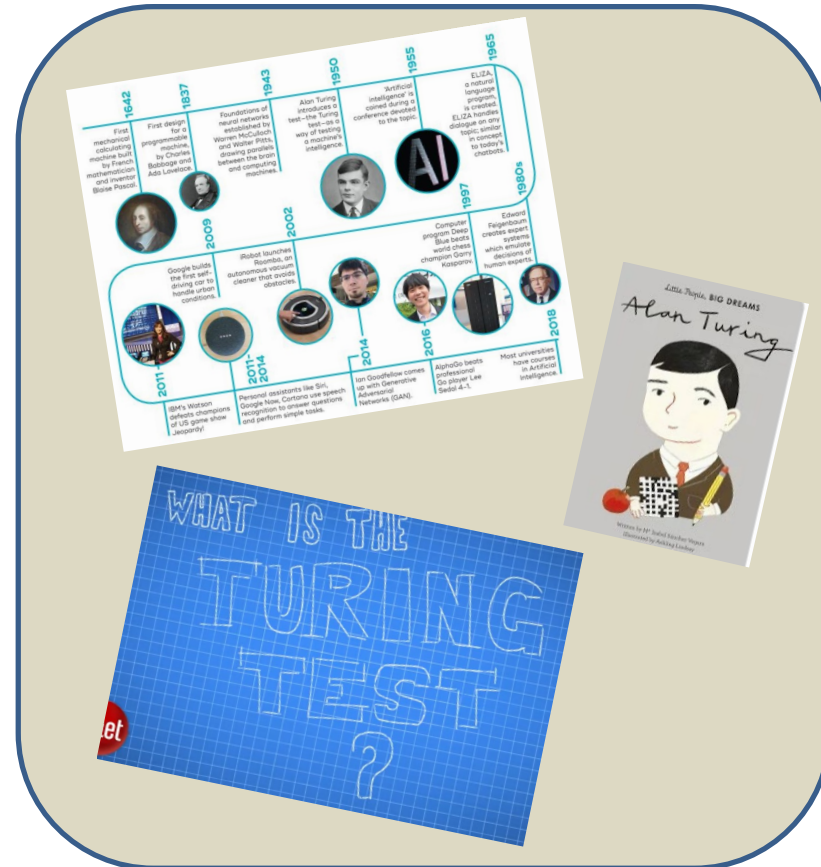
Teaching a machine to “read” and “listen” (interpret and analyse text and sounds).

... solve problems autonomously without explicit guidance from a human being.

Developing their understanding

Resources from CSER MOOC Teaching AI in the Primary Classroom, You Tube, Books...

- Looked at the evolution of AI.
 - Identify interesting events.
 - Research important figures ie Alan Turing, John McCarthy.
 - Watched video of Alan Turing ...Can Machines think?
 - Design a game based on the Turing Test in teams for others to work out human or computer.
 - Play the 'Intelligent Paper Game'...discuss.
- (CS Unplugged)



Developing their understanding

Evolution of AI. Prezi from CSER.

<https://prezi.com/view/GmFxO9w6KS8vhEAcaSC6/>

Girls spent time exploring different events and enjoyed playing Eliza 1966...inspired Chat Bots (Grok Learning)

Watch and respond to video: What is Machine Learning?

Work through Code.org AI activity.

<https://studio.code.org/s/oceans/stage/1/puzzle/2>

Examples of AI

Types of ML...supervised & unsupervised
(video on CSER MOOC).

How do humans learn?

Played memory game....discussed techniques.





Image recognition

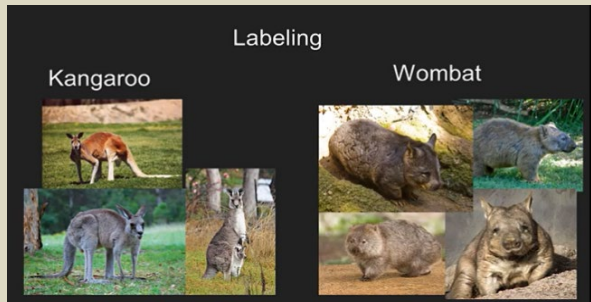
Computer vision is the ability of machines to recognise objects in images or videos.

We refer to this ability as image recognition.

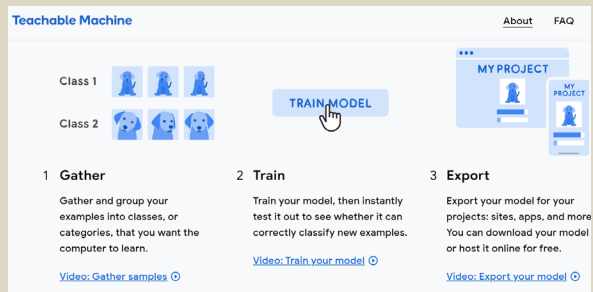
Examples of image recognition include face tagging on social media photos and vision used by self driving cars.

Developing their understanding

CSER video on Computer vision



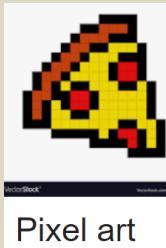
Google's Teachable machine



Apps that use AI

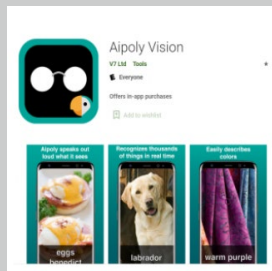


Internet search: Apps which used computer vision with a brief description.



Year 3 Are Machines Clever?

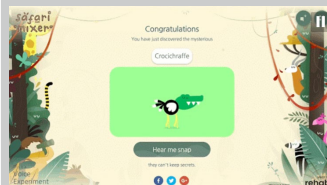
Airpoly Vision app



Computer vision is when computers can recognise and name them.

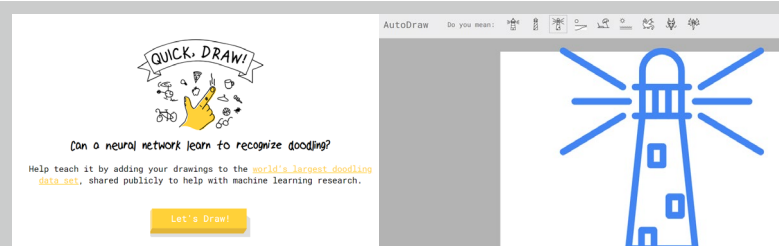
Using Airpoly Vision app see how many it can identify correctly. If not, why not?

Safari Mixer app



Using AI, Safari Mixer gives a complete audio and visual experience of the student's unique creation.

Quick draw and Auto draw



AI is using knowledge of shapes, pixels and feature extraction to guess what a human is drawing.



Speech recognition

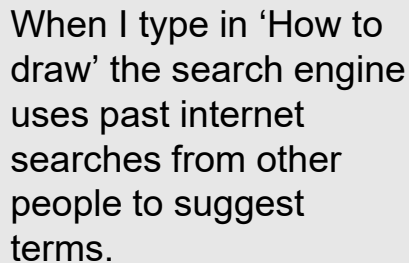


Natural Language Processing (NLP) is the ability of machines to interpret and analyse forms of human communication, such as text and speech.

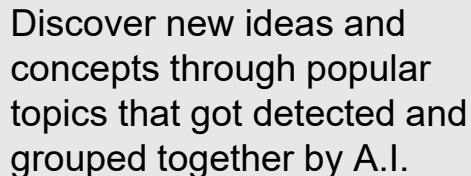
We refer to this ability as speech recognition.

Examples of speech recognition include chatbots and virtual assistants.

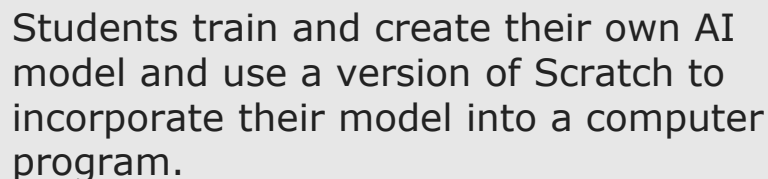
Internet searches



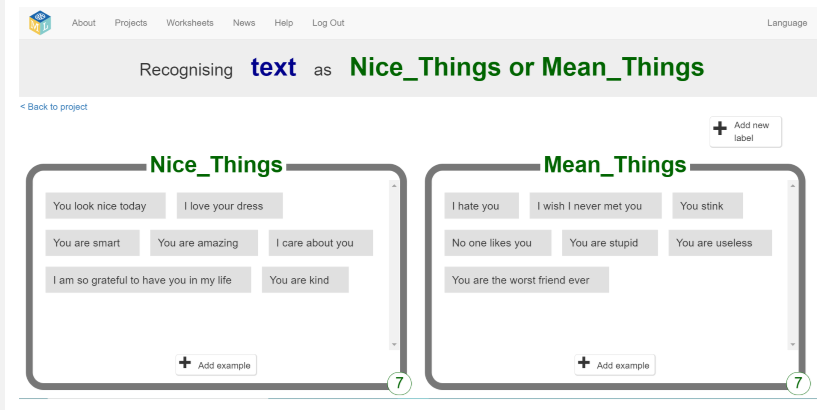
Twinword ideas



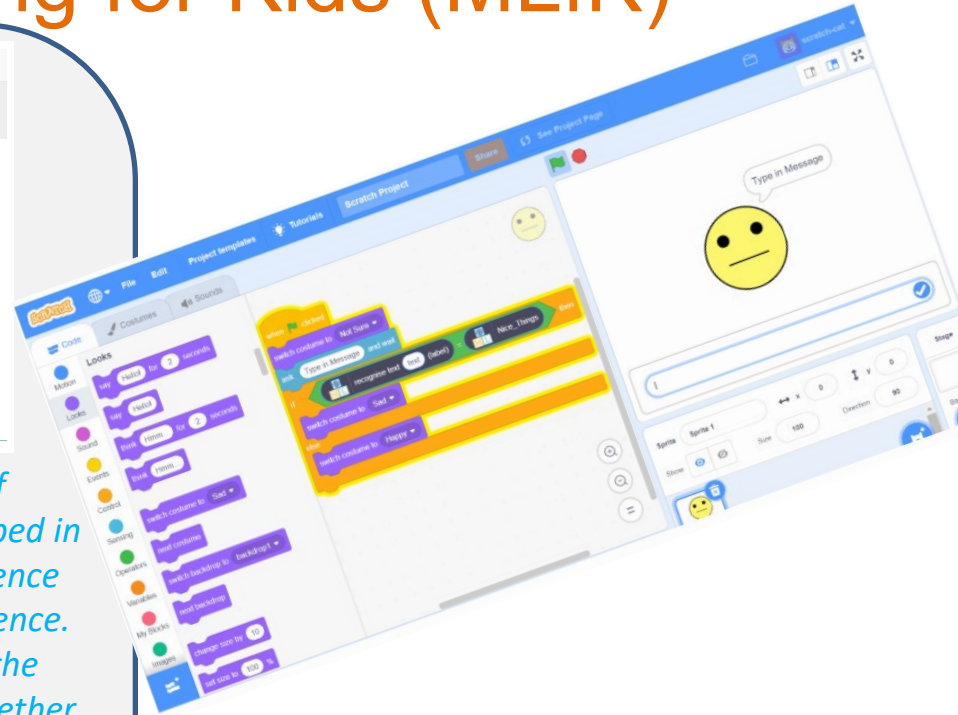
Machine Learning for Kids (MLfK)



Machine Learning for Kids (MLfK)



"My model was successful in recognising if the majority of sentences were a nice or mean thing. However, when I typed in 'You are mean' it said it was a nice thing with 69% confidence and 'You aren't mean' was a mean thing with 75% confidence. This indicates that the model mainly focuses on whether the sentence uses positive or negative language to decide whether it is nice or mean. In the sentence 'You aren't mean', aren't is a negative word so the model describes it as a mean thing. In the next sentence 'You are mean', are is a positive word so the model described it as a nice thing. "



Ethical issues

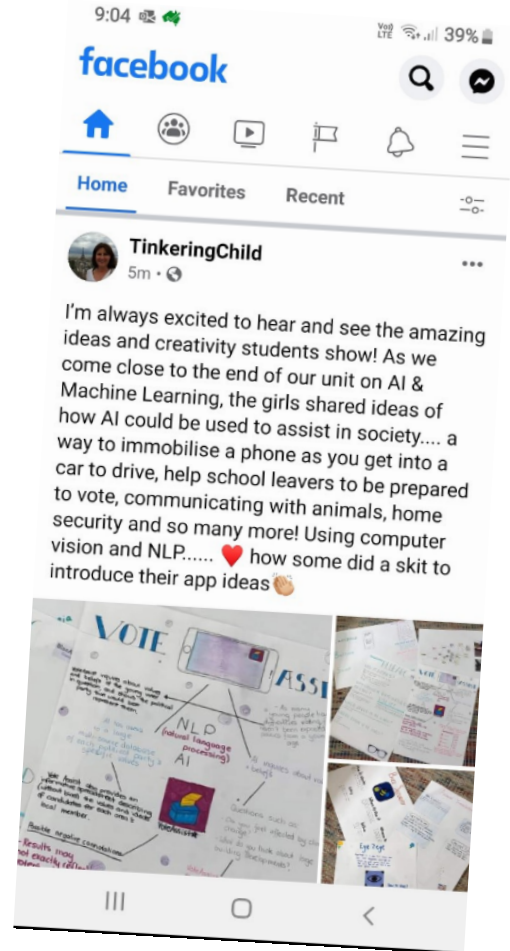
A situation where there are competing alternatives and the right thing to do is not obvious or clear.

Sometimes terms such as good, bad, wrong, better or worse are used to consider the effect of particular actions on our lives, society, nature and the environment.

Student project

Coming up with their own AI app idea

Our team is...	
We're creating an AI model that...	(the target user)
to help people to...	(the problem/challenge)
by providing them with...	(the possible solution)



Student project examples



Artificial Intelligence lesson plans

Humans display natural intelligence in contrast to machines that demonstrate artificial intelligence (AI).

AI has various definitions however for our purposes we are using the definition 'any device that perceives its environment and takes actions that maximize its chance of successfully achieving its goals' [1]. [Read more...](#)

The following lesson ideas cover a range of specialisations and subsets as indicated by colour coding. Click on the coloured squares to learn more about each definition.



Machine learning

Supervised learning

Natural language processing

Computer vision

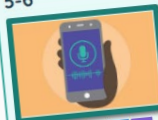
Classification

Lesson plans

Artificial Intelligence

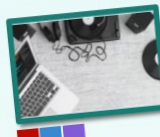
[Search DT Hub AI lesson plans](#)

5-6



Recognising AI

Use the tasks in this lesson to introduce concepts that underpin artificial intelligence (AI). The majority of the tasks are unplugged (do not require a digital device).



Note the music

An AI using the technique of clustering, looks for patterns in data. In this case the data is musical notes. Students can hard code a program that plays a particular note for a set beat (non-AI) or instead they can incorporate the random function to mimic AI clustering.



Analysis of AI applications drawing on ethical understanding

This lesson plan explores the ethical aspects of artificial intelligence and the implications on our future lives.



Home automation with AI

Home automation can take your voice commands using speech recognition AI as you talk to your mobile phone to control the lights, the fan, the air conditioner, or other smart devices. Students investigate the control required to switch lights and fans on or off through an artificial neural network.



Home automation programming

Investigate home automation systems, including those powered by artificial intelligence (AI) with speech recognition capability. Selects from tasks that cater for students' range of programming skills.



Can a computer recognise sentiment?

Natural Language Processing (NLP) interprets text and speech. Chatbots provide a useful context to explore NLP. In this module students code a chatbot in Python, a conversational program capable of responding in varied ways to user input, including with analysis.



AI ethics - What's possible, probable and preferred?

The development and ubiquity of Artificial Intelligence raise a number of social and ethical matters that students can explore in the Digital Technologies classroom. This lesson idea outlines a project to help students frame such discussions using the curriculum Key Ideas.



Data bias in AI

Artificial intelligence can



Anti-bullying AI

Natural Language Processing interprets text and speech.



Fun engine translation

Natural language processing

F-2

3-4

7-8



Home automation with AI

Use the tasks in this lesson to introduce concepts that underpin artificial intelligence (AI). The majority of the tasks are unplugged (do not require a digital device).



Home automation with AI

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Home automation with AI

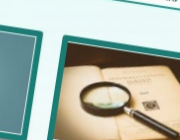
Use the tasks in this lesson to introduce concepts that underpin artificial intelligence (AI). The majority of the tasks are unplugged (do not require a digital device).

9-10



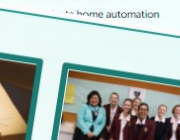
Coding a sentimental chatbot in Python

Natural Language Processing (NLP) interprets text and speech. Chatbots provide a useful context to explore NLP. In this module students code a chatbot in Python, a conversational program capable of responding in varied ways to user input, including with analysis.



Book analysis with AI techniques

Explore text analysis through Natural Language Processing, a significant application of Artificial Intelligence. View a series of video tutorials to develop a Python program that can break down and analyse the content of a complete text, such as Robert Louis Stevenson's *Treasure Island*, and use smart sentiment analysis to attempt to determine the villain(s) and hero(s).



What would my preferred AI future look like?

Malyin Mawby, Head of Personalised Learning at Roseville College, explains how she implemented project-based learning (PBL) with her year 10 class to explore Artificial Intelligence (AI). Through the PBL task, students selected an area of interest and investigated what is possible, probable, and preferred.

Achievement standards: what I covered

Achievement Standard

By the end of Year 4, students describe how a range of digital systems (hardware and software) and their peripheral devices can be used for different purposes. They explain how the same data sets can be represented in different ways.

Achievement Standard

By the end of Year 6, students explain the fundamentals of digital system components (hardware, software) and how digital systems are connected to each other. They explain how digital systems use whole numbers and fractions to represent a variety of data types.

Students define problems in terms of data and requirements and design solutions by developing algorithms that address the problems. They incorporate decision-making and repetition and user interface design into their design. They explain how information systems and their solutions meet needs and consider sustainability. Students manage the creation and communication of ideas and information in collaborative digital projects using validated data and protocols.

Achievement Standard

By the end of Year 4, students describe how a range of digital systems (hardware and software) and their peripheral devices can be used for different purposes. They explain how the same data sets can be represented in different ways.

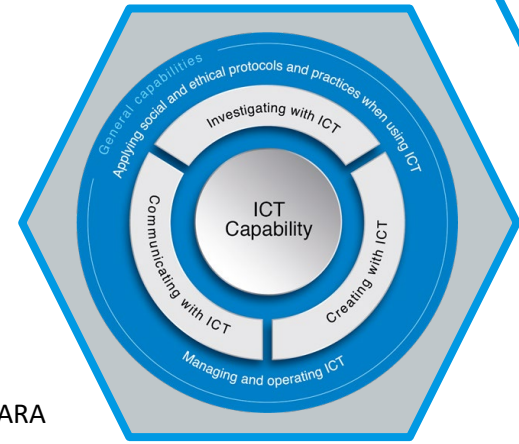
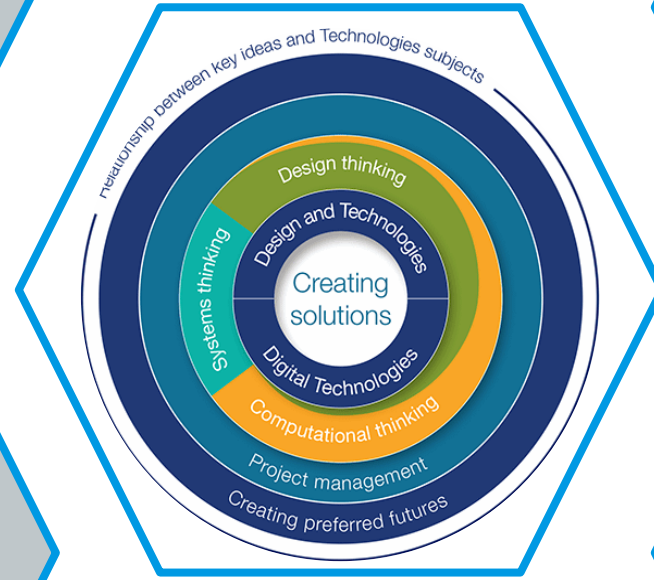
Achievement Standard

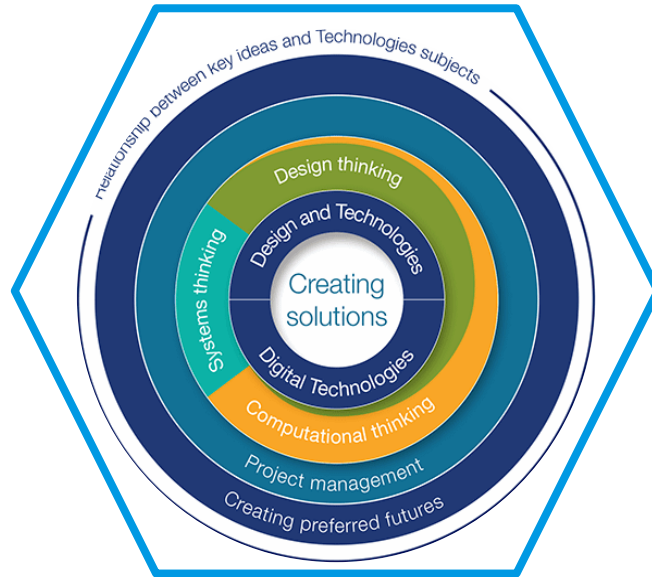
By the end of Year 8, students distinguish between different types of networks and defined purposes. They explain how text, image and audio data can be represented, secured and presented in digital systems.

Students plan and manage digital projects to create interactive information. They define and decompose problems in terms of functional requirements and constraints. Students design user experiences and algorithms incorporating branching and iterations, and test, modify and implement digital solutions. They evaluate information systems and their solutions in terms of meeting needs, innovation and sustainability. They analyse and evaluate data from a range of sources to model and create solutions. They use appropriate protocols when communicating and collaborating online.



AI KEY CONCEPTS



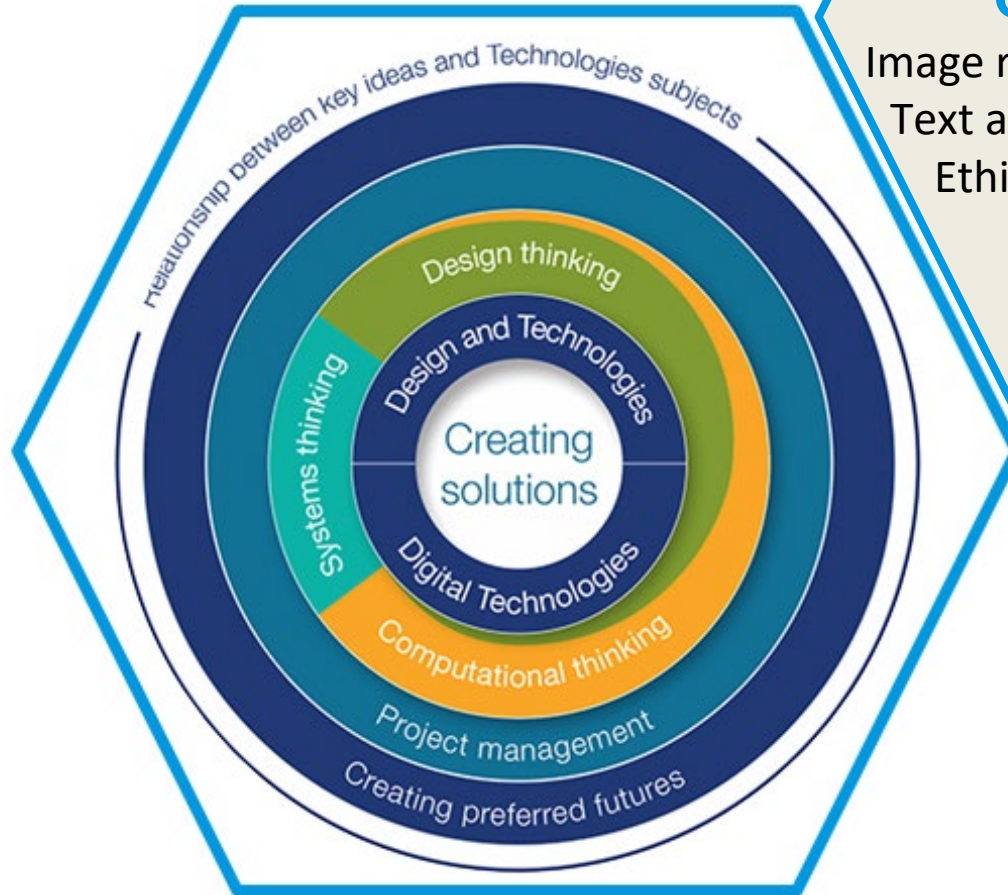


AI KEY CONCEPTS

Image recognition

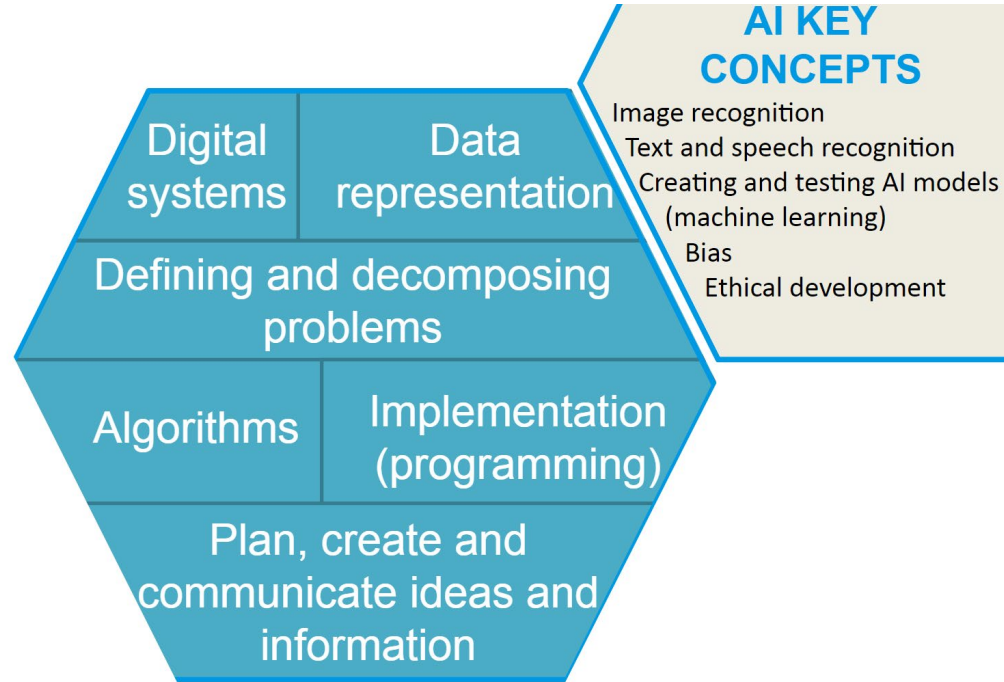
Text and speech recognition

Ethical development



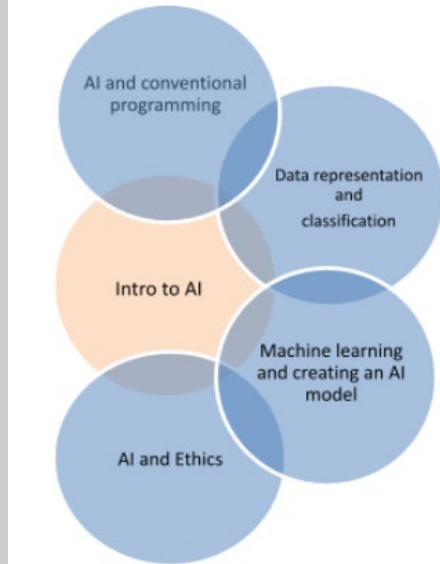
Next steps...

Use the chat to write your idea of where you will include AI as part of your teaching and learning program



Term 3 free PL ...

Primary AI PL



Secondary AI PL

