TRAILS.SCOT | Teaching Responsible AI Literacy in Schools

AI in Secondary Schools: Developing Resources and Professional Learning for Teachers and with Teachers

Dr Serdar ABACI

20 May 2026

Keynote Talk at the Responsible Use of AI by Teachers: From Research to Practice

Ho Chi Minh City University of Education

THE UNIVERSITY of EDINBURGH | Scottish Government Riaghaltas na h-Alba gov.scot | Education Scotland Foghlam Alba | SQA

We live in interesting times 🤖🙈

- GenAI is here, whether we like it or not
- Children and teachers use GenAI whether we like it or not
- There is a massive **gap in research evidence** about the impact of AI on learning
- There is a massive **policy gap** about the use of AI in schools
- Tech companies, policymakers, teachers and learners are **not** going to wait for researchers to get the funding to conduct studies
- Even if school systems banned AI while waiting for evidence, children could still use it at home without support and guidance

Young people want to learn about AI

> **AI Should be in the curriculum.** AI will be in all our lives, so we need to learn and understand what it means before we grow up.

> **The more we learn about AI, the more we'll know how to keep ourselves safe.**

Explain **AI basics** in schools

Teachers should learn about AI and children's rights to support children's learning and help to keep them safe.

More discussion in schools about **safe usage** and **ethical issues**

Opportunities to **practice and play** with AI

Teachers can use AI systems to help make learning fun – **children learn better when it's fun.**

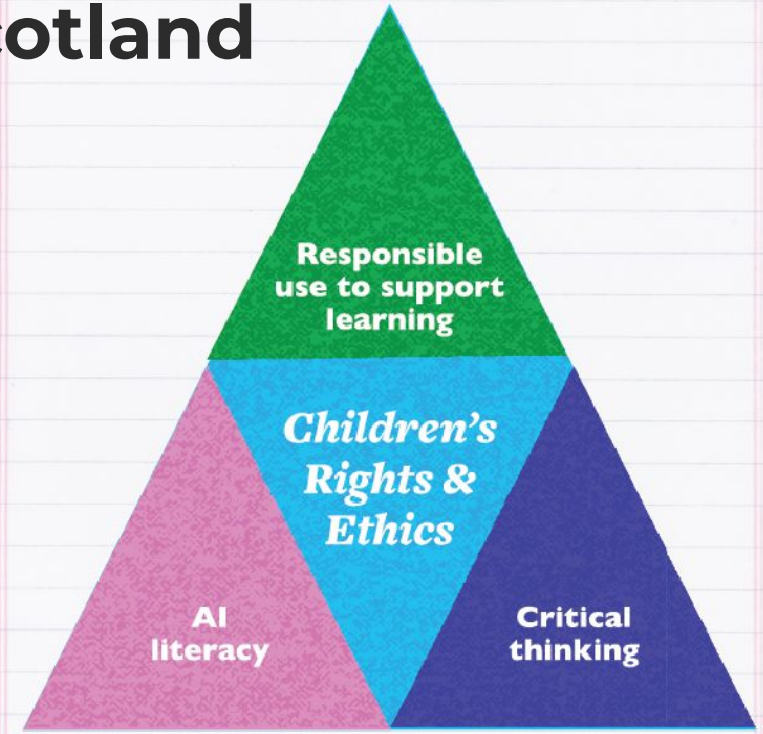
Immersive **AI experiences:** games, tutors, historic tours

(RESEARCH FROM CHILDREN'S PARLIAMENT AND ADES/HORIZON)

Objectives & Outputs

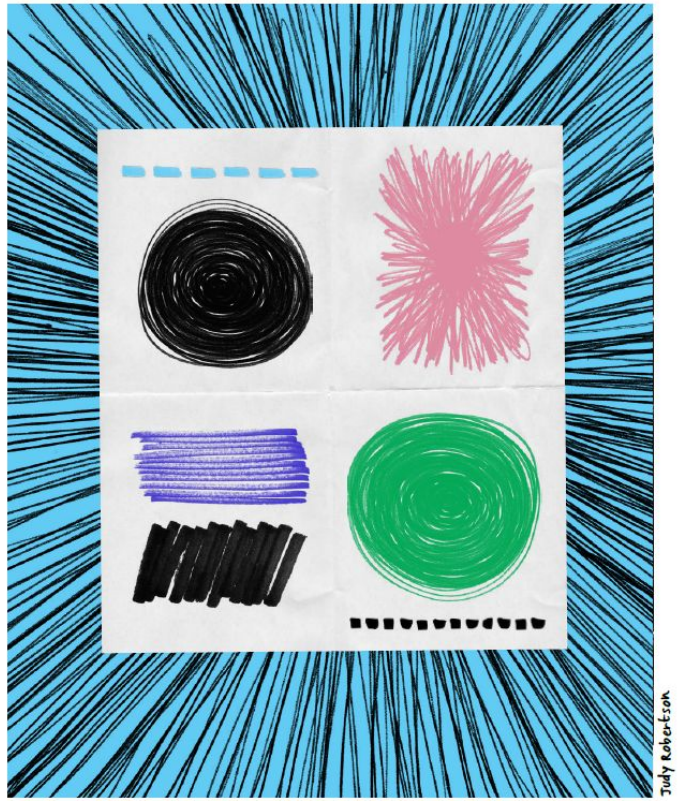
1. Develop core resources about critical AI literacy
2. Working with ‘AI Teachers-in-Residence’, co-create subject specialist resources and TPL opportunities in 5 subject areas and ASN.
3. Develop an evaluation website for teachers to provide expert-/peer-review on the AI resources and their uses in the classroom.
4. Collect evaluation evidence from teachers who have attended the AI professional learning and subsequently tried the resources in their classrooms.

A draft AI curriculum framework for Scotland



Teach AI Literacy
A Guide for Teachers

work-in-progress



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CHILDREN'S RIGHTS & AI USE IN EDUCATION

A GUIDE FOR TEACHERS & SCHOOLS

RIGHT TO BE HEARD

ARTICLE #12

Children have the right to express their views, feelings and wishes in all matters affecting them and to have their views considered and duly weighted in decision making.

GOOD PRACTICE: A school uses an anonymous feedback box to gather learners' opinions on AI software used in classrooms, and school policies on acceptable AI use.

FREEDOM OF EXPRESSION

ARTICLE #13

Children have the right to freely express their thoughts, ideas, and feelings.

This includes communicating in ways that suit their preference and needs - through speech, writing, art, or other forms. It also includes the right to express themselves with or (if they prefer) without the help of AI tools in educational settings.

GOOD PRACTICE: A teacher shows their learners how to use GenAI tools to formulate and express their ideas more clearly by suggesting edits to make text more readable. They illustrate how to overcome writer's block by asking a GenAI tool for a range of suggestions of what might happen next in a story. The teacher works with the class to write prompts and draw sketches as input to an age-appropriate image-generation tool, moderating the output before showing it to the class.

CHILDREN'S BEST INTERESTS

ARTICLE #3

The child's best interests are a primary consideration in any decisions that apply to them.

WATCH OUT FOR: When considering whether to adopt an AI tool to save teachers time, consider whether it is in the learners' best interests. AI-generated feedback or lesson plans may contain mistakes or be of poorer quality than the teacher would normally provide.

GOOD PRACTICE: A teacher uses an GenAI tool to produce a lesson plan suitable for their class and suggestions for differentiated activities. They check the output carefully for errors. The teacher informs the learners that they used GenAI for this purpose.

EDUCATION

ARTICLES #28 & #29

Children have the right to a good education that helps them to reach their full potential.

Children's education should help them use and develop their personality, talents and abilities. Education should also help children learn to live peacefully, develop children's respect for the environment, and others. AI has the potential to help children with their learning, but it is not a replacement for highly skilled human teachers who will always be central to children's education.

GOOD PRACTICE: Schools work together (with learners and parents) on a clear policy about GenAI usage so everyone understands acceptable uses of AI to support learning. The teachers guide the learners in using AI tools to help them with learning tasks such as ideas generation, text editing, revision, or practising language skills.

They teach learners how to use AI tools critically and explain the basics of how AI technology works. The learners discuss ethics and the societal implications of AI.

ACCESS TO INFORMATION

ARTICLES #17 & #13

Children have the right to access reliable information from diverse sources, especially information that promotes their well-being, understanding, and development. GenAI tools can be a useful information source but should be used with care.

WATCH OUT FOR: Make sure your learners know that GenAI tools often produce output which is incorrect.

GOOD PRACTICE: A teacher works with her class to explore how GenAI tools can help summarise information from diverse sources in easy-to-understand language. They learn how to fact-check GenAI output and compare it to other information sources, such as encyclopedias and search engines.

PRIVACY

ARTICLE #16

Children have the right to privacy, and their personal data and communications must be protected.

WATCH OUT FOR: Ensure that any AI tool does not have access to learners' personal or sensitive data without consent from the child and their parents. For example, if using a GenAI writing tool to give personalised feedback on a student's essay, remove the student's name and any identifying details, ensuring the child's privacy is respected.

RIGHT TO BE KEPT SAFE

ARTICLE #19

Children have the right to be protected from harm, being hurt and mistreated, in body or mind.

WATCH OUT FOR: Check the age-rating for any GenAI tool you use in school. Many image-generation tools are intended for a general audience, and although they often have guardrails to prevent inappropriate images, this can't be guaranteed. Also check that they don't suggest inappropriate images in recommended related content e.g. "if you like this image, you will also like these".

GOOD PRACTICE: A local authority installs AI-powered content filters to block harmful or inappropriate material in all schools to help children explore diverse topics safely. The content filters have school-level and parental controls to ensure that humans can appropriately intervene. The school staff are trained to watch for signs that children may be upset by encountering inappropriate AI-generated material.

NON-DISCRIMINATION

ARTICLE #2

All children's rights apply to every child equally, regardless of their differences and they should be able to exercise their rights without discrimination.

WATCH OUT FOR: If choosing an AI tool for personalised learning, ensure that it doesn't use biased racial or socio-demographic data to predict students likely to be "at-risk" for poor exam performance.

WATCH OUT FOR: If your school is considering purchasing 'AI detection software', be aware that such technology is currently not very effective and is more likely to incorrectly accuse people with poorer English writing skills of cheating with AI. This could potentially discriminate against students with English as a second language or those with neurodevelopmental disabilities.

WATCH OUT FOR: When choosing speech recognition tools, check whether they work well with diverse accents. If not, it would make it harder for some students to use voice-activated features effectively, potentially reducing their participation and making it harder for them to learn.

DISABILITY

ARTICLE #23

Children have the right to special education and care if they have a disability, as well as all the other rights so that they can live a full life. Although AI as a concept may be beyond the cognitive capacities of some learners, this does not mean they should be excluded from experiences that use AI to enhance learning.

GOOD PRACTICE: An ASL teacher uses AI tools (assistive technology) to help children with diverse needs and abilities express themselves and engage in learning activities in school. She also gives her learners with neurodevelopmental disorders extra support to understand how AI-generated pictures and images might be biased.

EVOLVING CAPABILITIES

ARTICLE #5

Children grow and develop at different paces, influenced by their age, experiences, and circumstances. Parents should guide and support children in making decisions that respect their agency and evolving capacities. Teachers also apply their expertise in children's development to guide appropriate AI usage.

GOOD PRACTICE: A primary teacher guides children in using GenAI tools by showing them how to use them effectively for tasks like brainstorming or editing. He initially starts by modelling how to use GenAI tools so that children do not use GenAI unsupervised. He and his colleagues provide close, step-by-step support for students and encourage critical thinking about GenAI output. As children's skills and maturity grow, the teachers in the school cluster plan to gradually reduce support and foster independence, aligning with the learners' experiences and evolving capacities.

PROTECTION FROM EXPLOITATION

ARTICLES #32–#36

Children have the right to protection from exploitation, including commercial exploitation. This could include software tools which profit from their data.

WATCH OUT FOR: Be careful not to use commercial GenAI tools that collect and use children's data to improve their models or services for companies' own profits without the children's or parents' consent.

If you're choosing AI-driven assessment/marking software, be careful that children's work and exams (without their consent) aren't used to improve new versions of the software without their consent.

FREEDOM OF THOUGHT

ARTICLE #13

Children have the right to their own thoughts and beliefs and to choose their religion with guidance from their parents, consistent with their evolving capacities. This includes the right to views about AI and beliefs about how humans should use it.

GOOD PRACTICE: A young person does not want to use a GenAI tool for her school work because she believes it is morally wrong to use a tool that profits from the theft of copyrighted material and harms artists. Her teacher supports her in carrying out the task without using AI but ensures that she still learns about how AI works.

USEFUL LINKS & SOURCES

Remember: there are many more examples than we could fit on this poster! You probably have already developed good practice in your own school. For more information and resources, follow the QR code.

https://trails.scot

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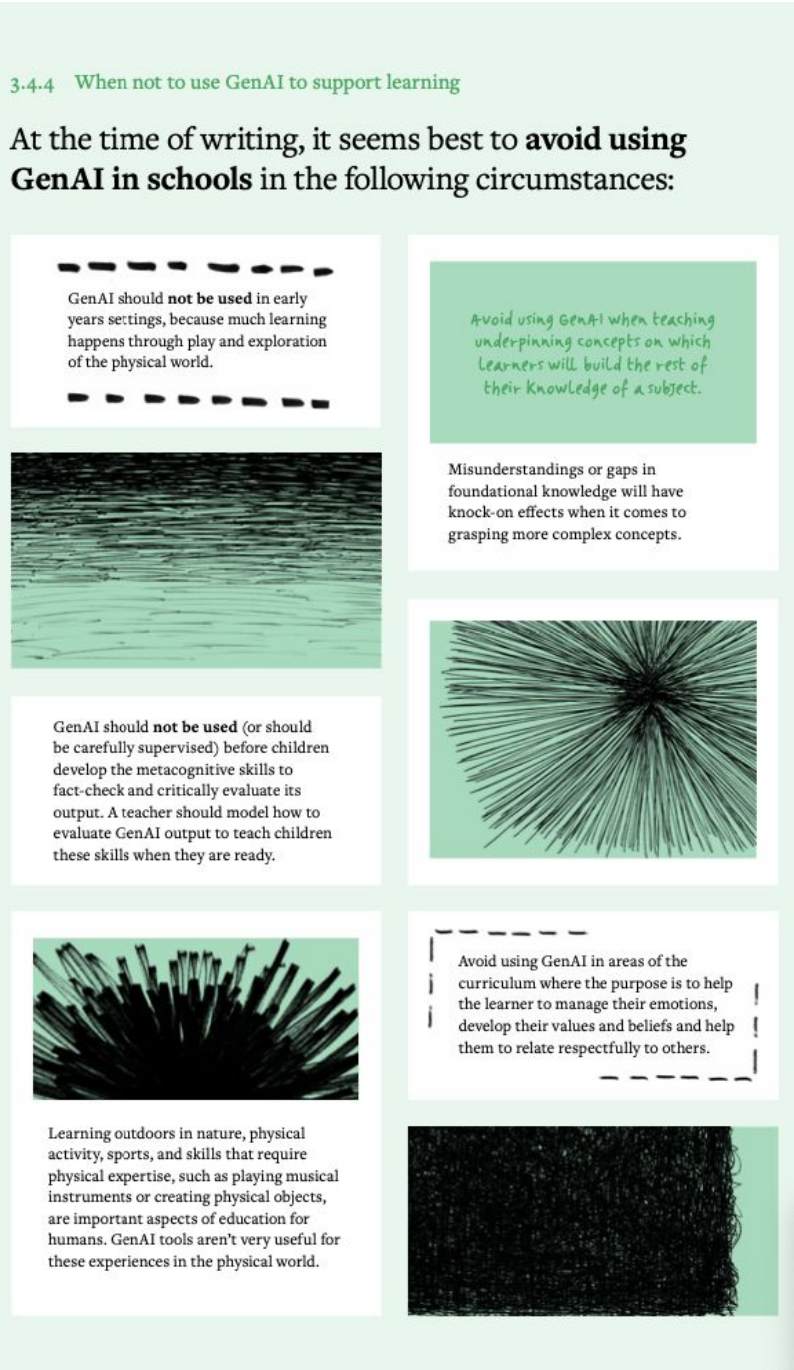
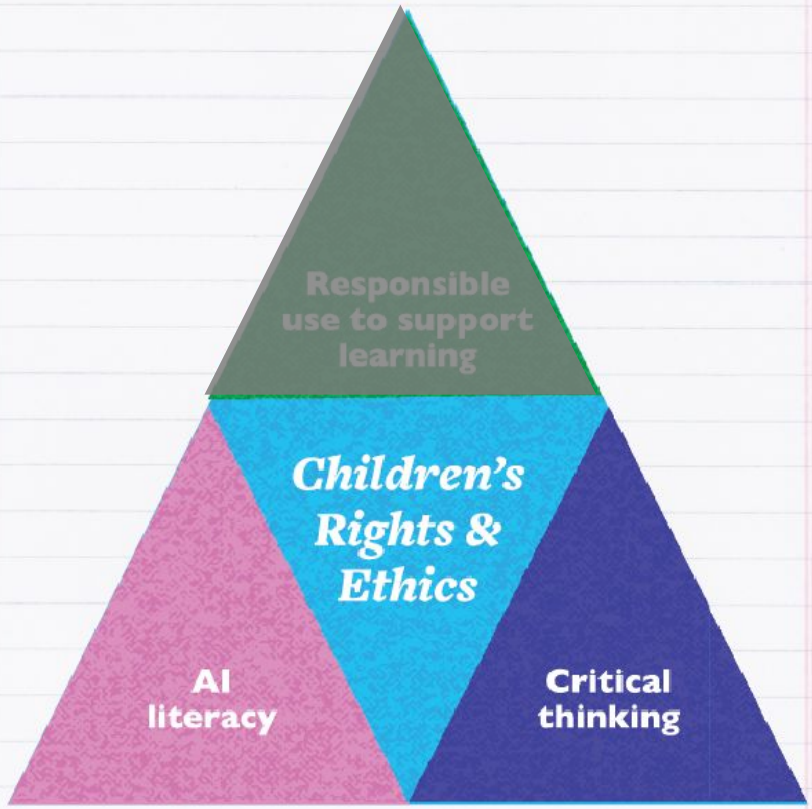
This poster was created by Ayça Atabey, Judy Robertson and Elspeth Maxwell.
Thanks to Kevin Mcphee, Gregory Metcalfe and Kay Tisdall for their help.

When **not** to use GenAI

- Early years
- Outdoor learning/physical skills
- When building foundation concepts
- Before learners have meta-cognition skills for fact checking
- Social/emotional/relationships

What do you think?





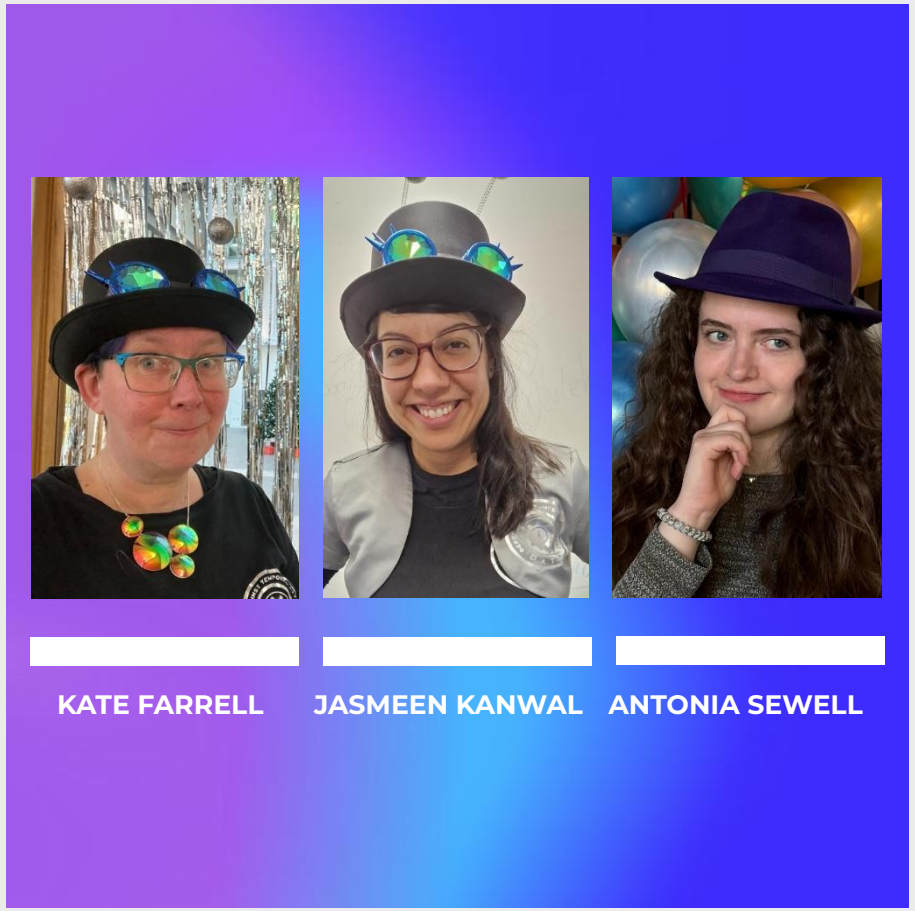
Core resources

Learning about AI

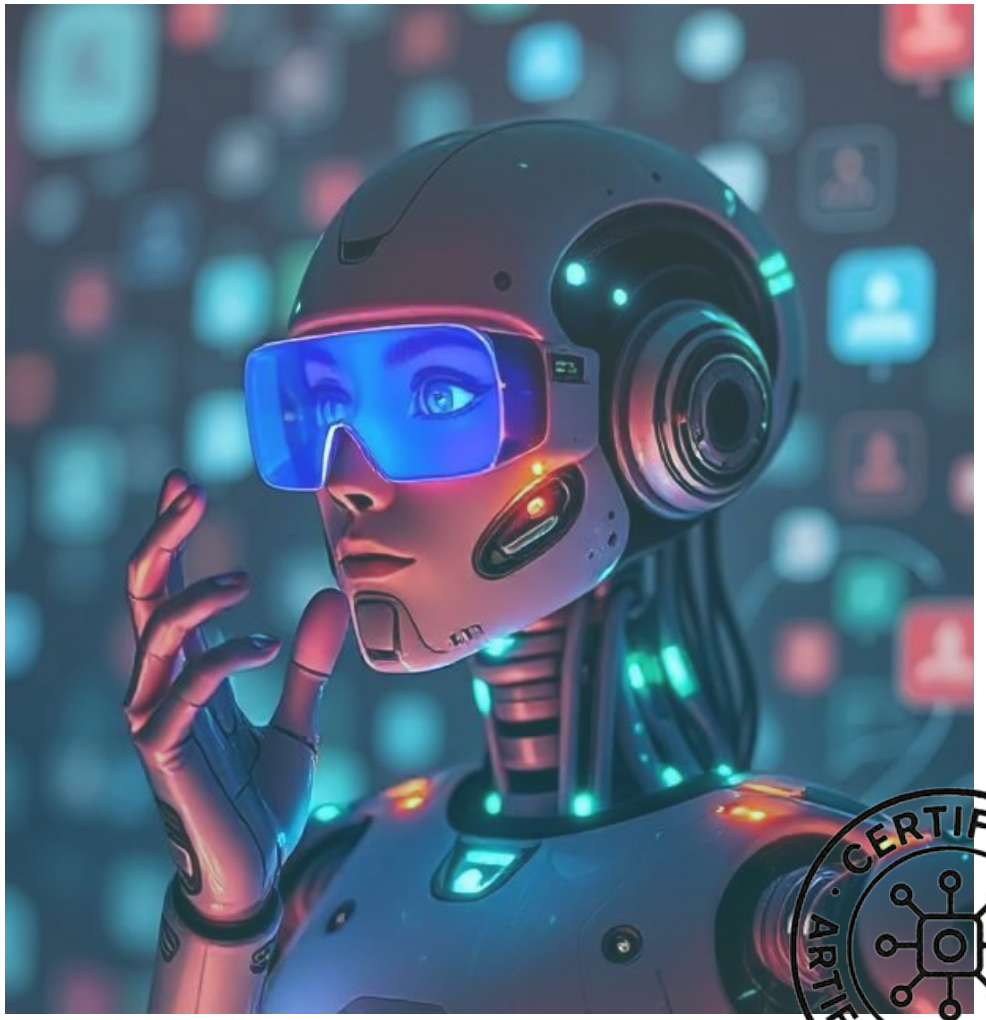
A selection of **fun, low-tech, accessible activities** for **any Secondary teacher** introducing concepts in artificial intelligence

- Different types of AI systems and how they work
- Critical thinking skills
- Ethics, bias and sustainability issues

TRAILS.scot/resource



How AI influences you



- Movie Night Activity

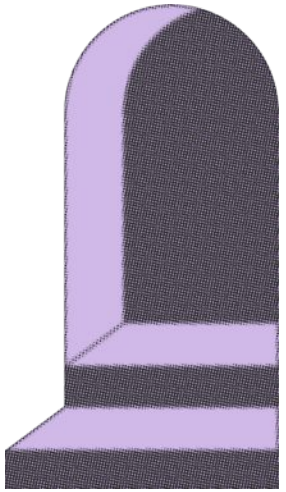
In this activity, you'll first create a film recommender system using the **"content filtering"** method, and then one using the **"collaborative filtering"** method.

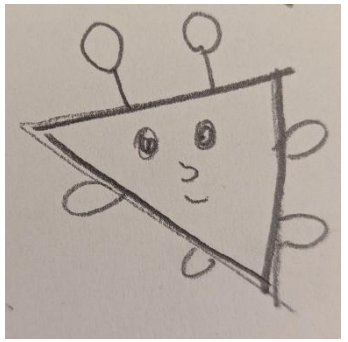
How AI labels the world

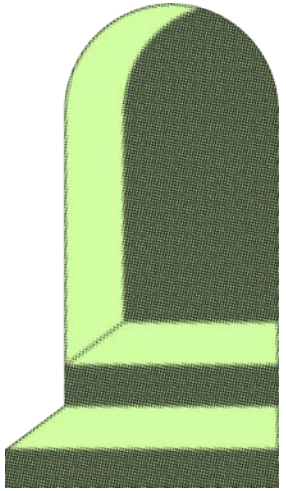
- Classify like an AI!

We are going to learn to classify two different alien species: **Blorps** and **Glixers**.

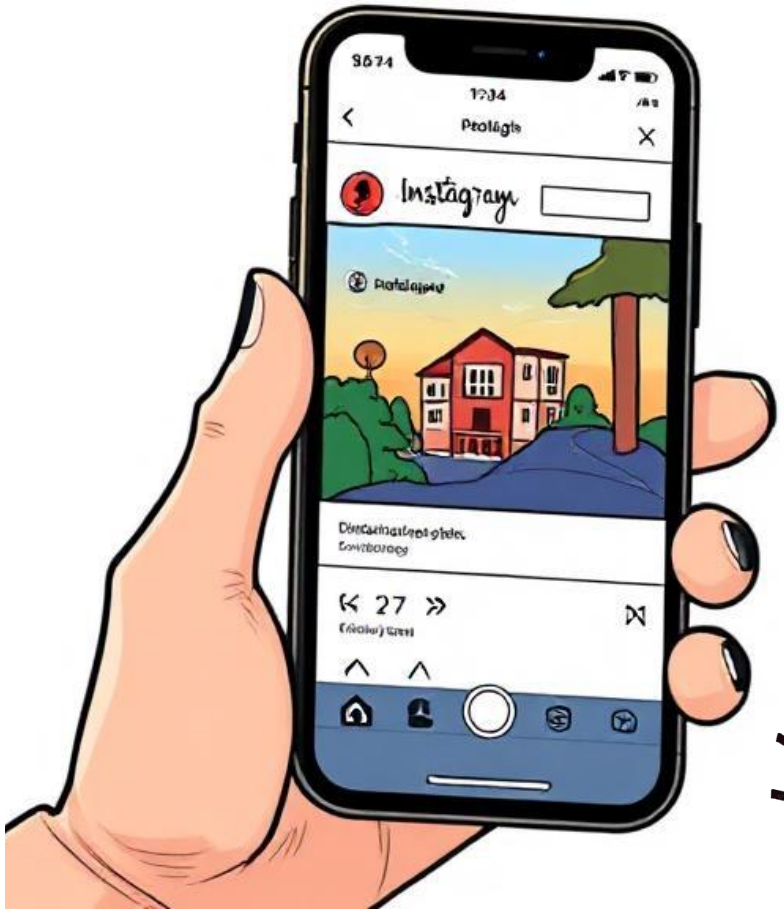
In order to learn to tell which is which, you will look at images of them. This is a bit similar to how an AI classification system learns.

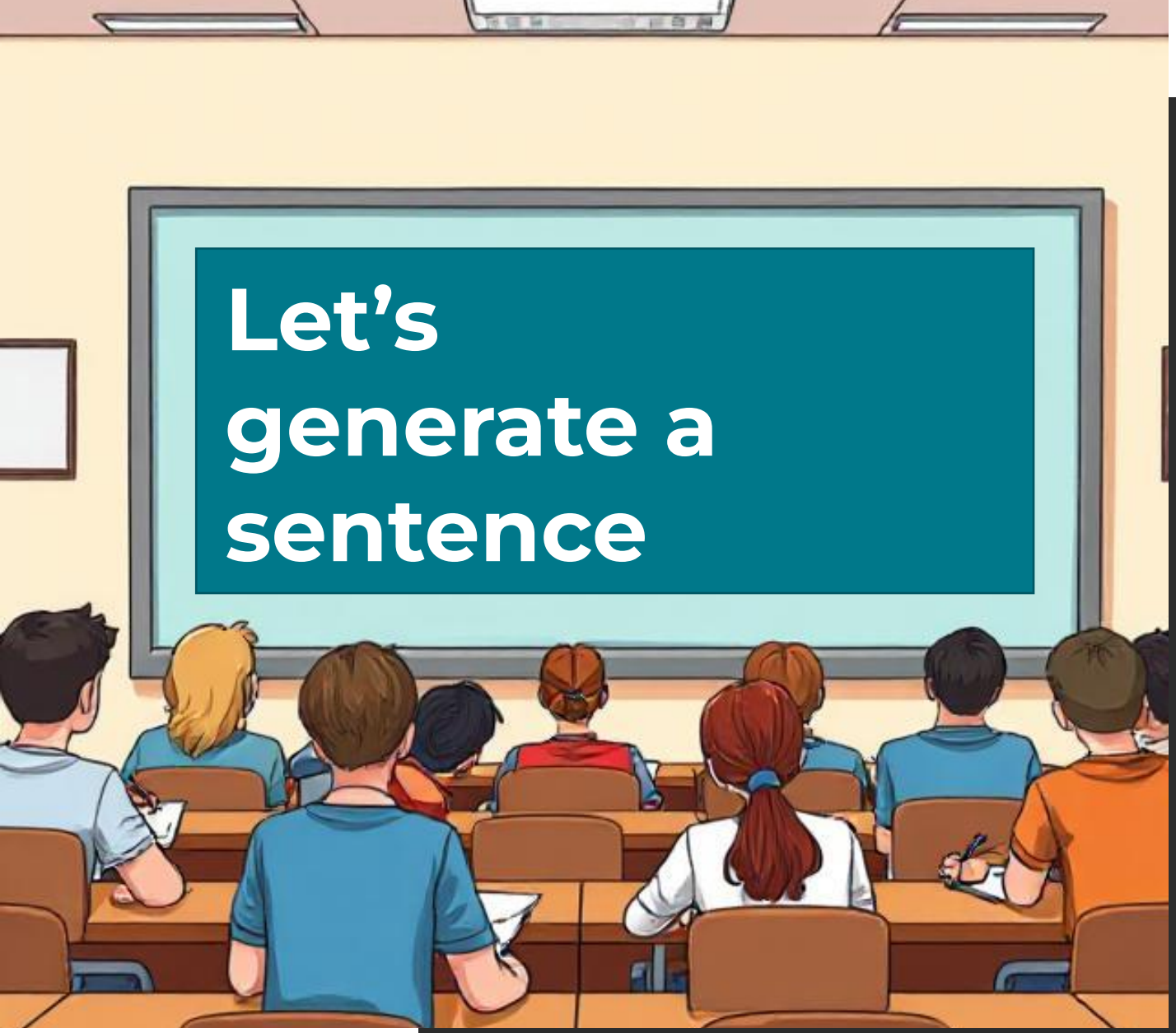






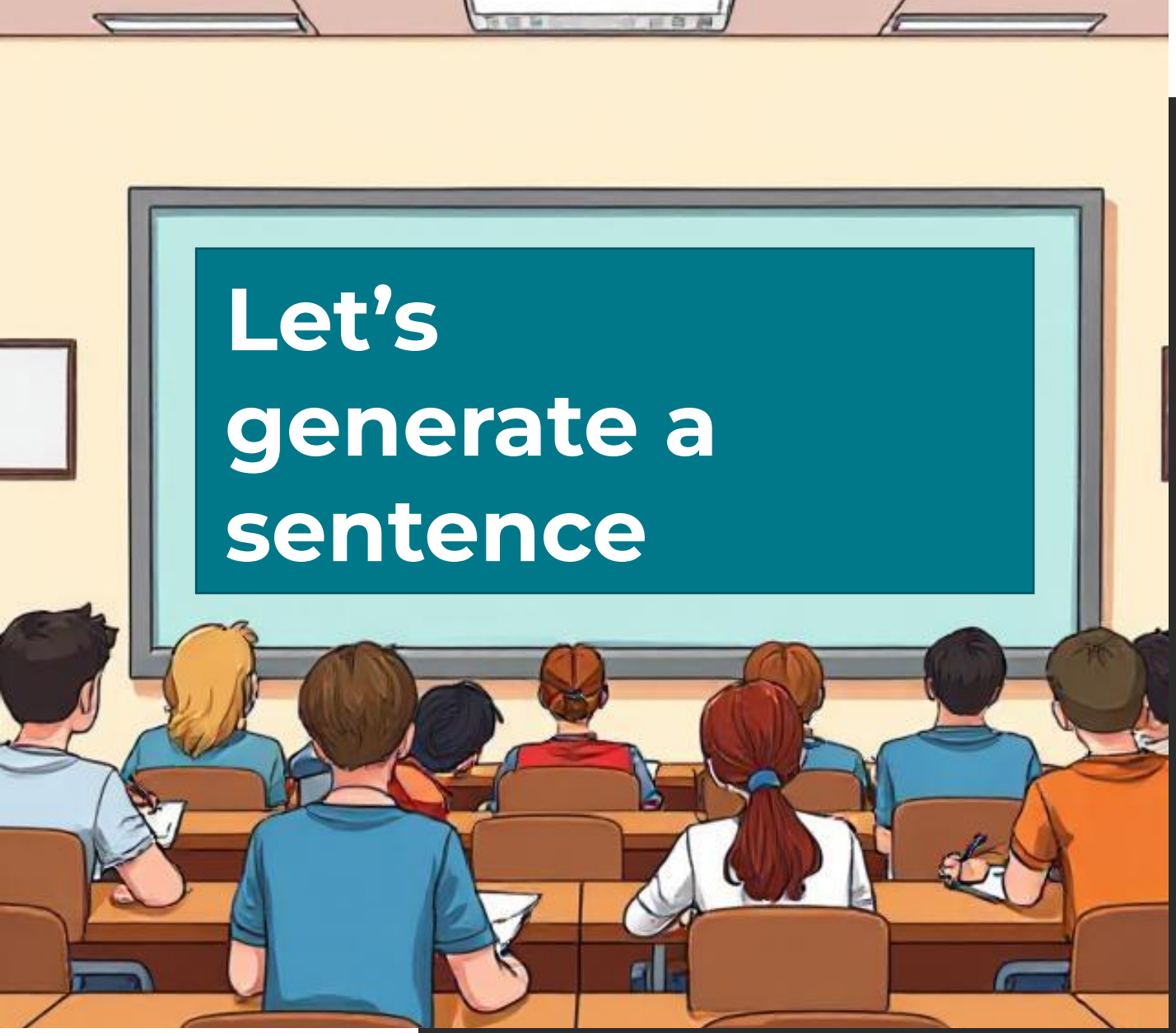
How AI creates content





Now, let’s take part in an exercise that will help us understand the very basics of how LLMs work.

In this activity, we’ll work together to generate a sentence in a similar (but much simpler) way to LLMs.



You are going to train our model by giving examples of:

- An **animal** (like ‘cat’ or ‘aardvark’)
- A **past tense verb** (like ‘sat’ or ‘spoke’)
- A **preposition** (such as ‘on’ or ‘opposite’)
- And an **object** (like ‘mat’ or ‘pencil case’)

Let’s write a story

The previous method just used *frequency* (most popular word) to choose each word in the sentence.

But LLMs use *context* as well, including looking at the prompt, and a certain window of words that came before in the text to determine the most probable next word.

In this next activity, we’ll use a **prompt** and a **context window** to help us generate a story!

Context window

Alice was beginning to get very tired of sitting by her sister on the bank, and of having nothing to do: once or twice she had peeped into the book her sister was reading, but it had no pictures or conversations in it, "and what is the use of a book," thought Alice, "without pictures or conversations?"

What word should come next?

Let’s write a story

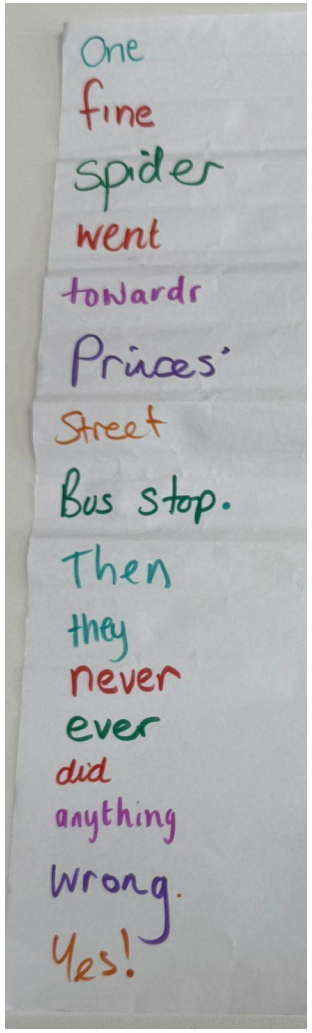
Your prompt is:

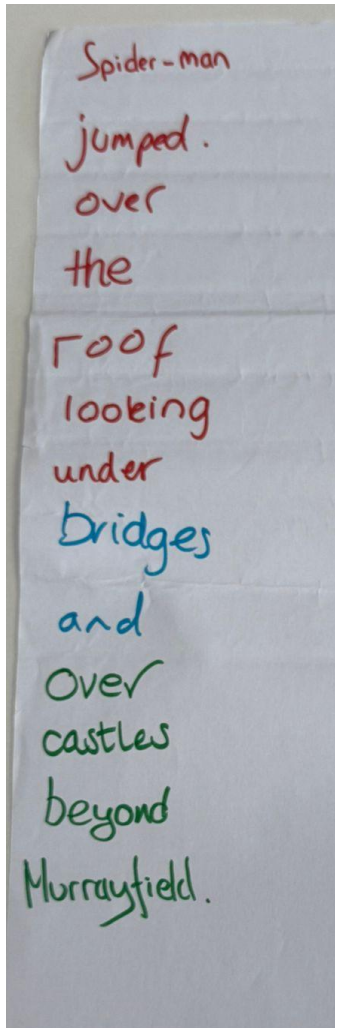
Write a story about Spider-Man visiting Edinburgh

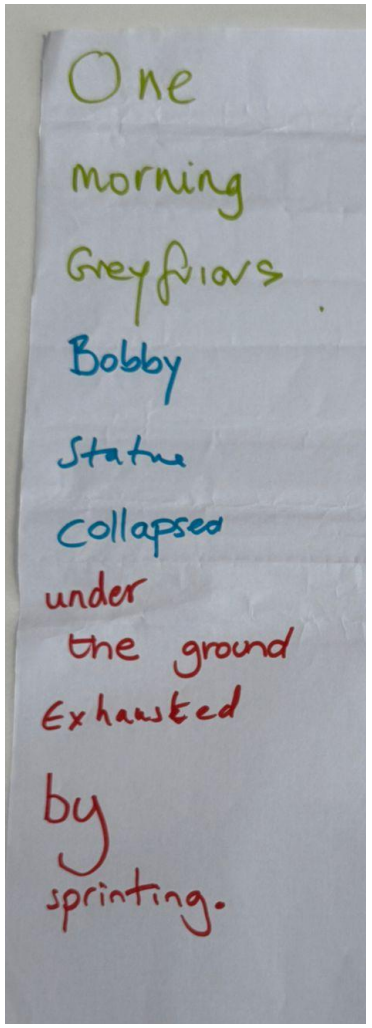
Let’s write a story

1. Write a word. Pass the paper on.
2. Write a second word below the first.
   Pass the paper on.
3. Write a third word below the second.
   Pass the paper on.
4. Write a fourth word. Fold the paper to cover the first word. Pass the paper on.
5. Write another word.
   Fold the paper and pass it on.
   Only three words to be visible at any time

Let’s write a story



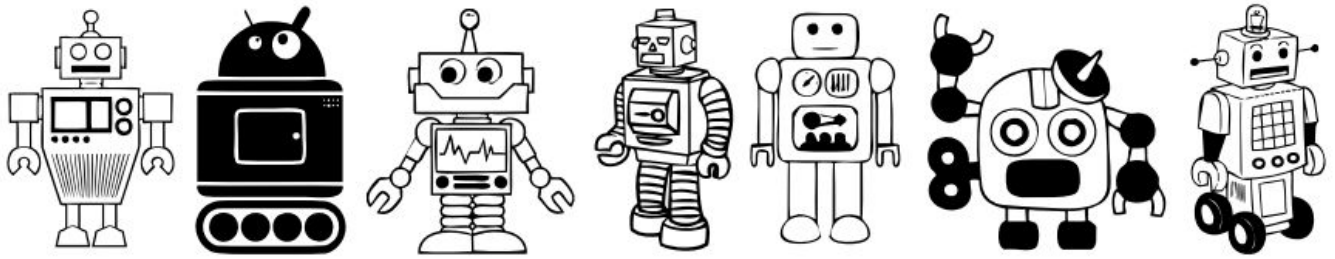




Bot. or Not???

Which answer was written by an AI chatbot and which was written by a human?

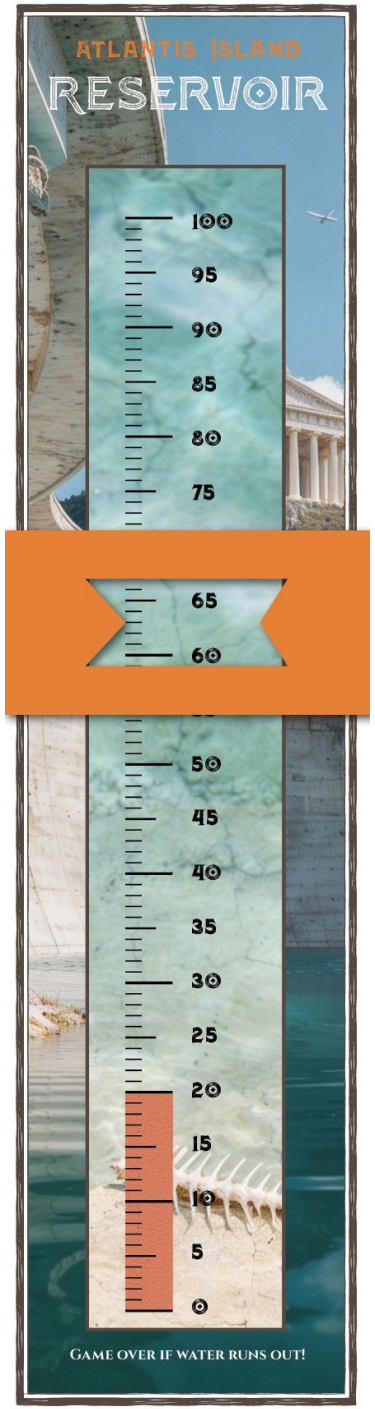
Put a robot sticker next to your bot guess!



What are you doing this weekend?

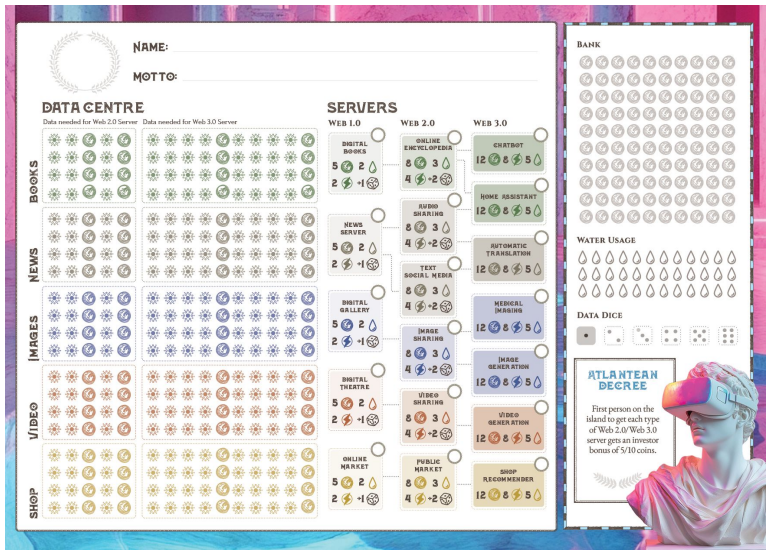
1. This weekend, I'm planning to catch up on some reading and maybe try out a new recipe I've been wanting to make.

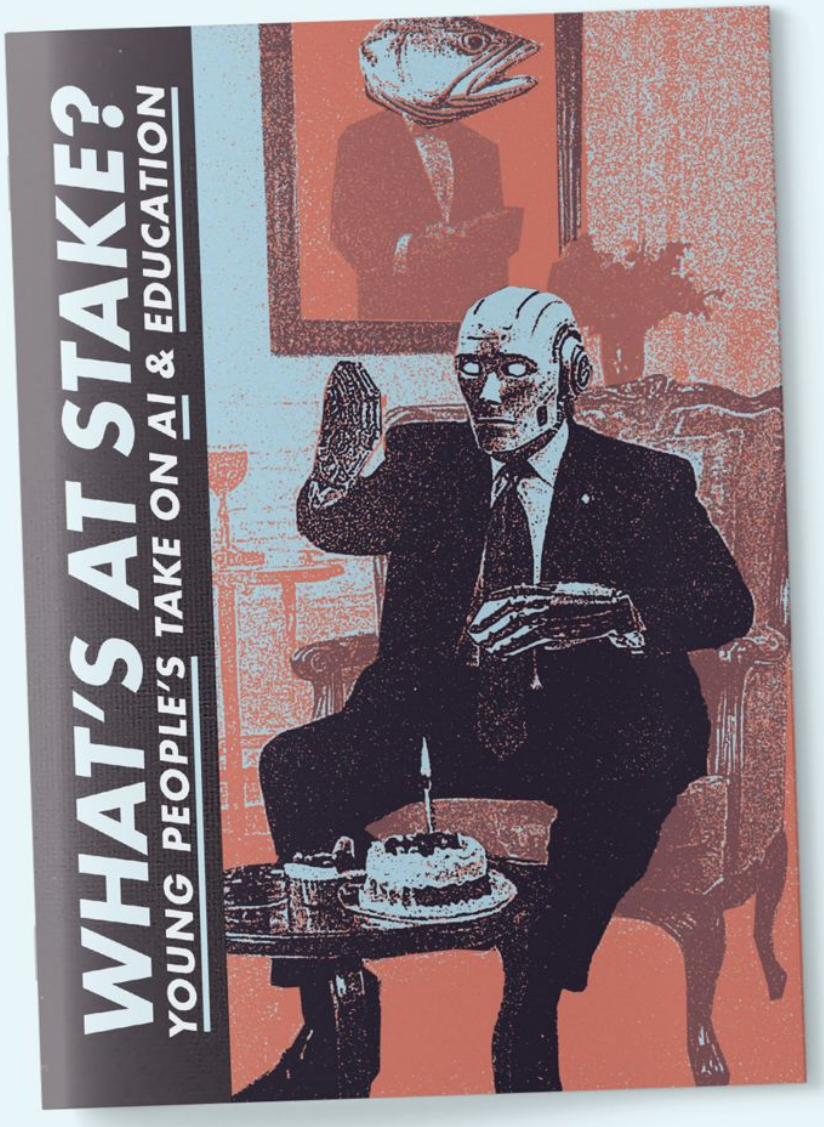
2. I’m going to take it easy, sleep in, and then play computer games and a new board game.



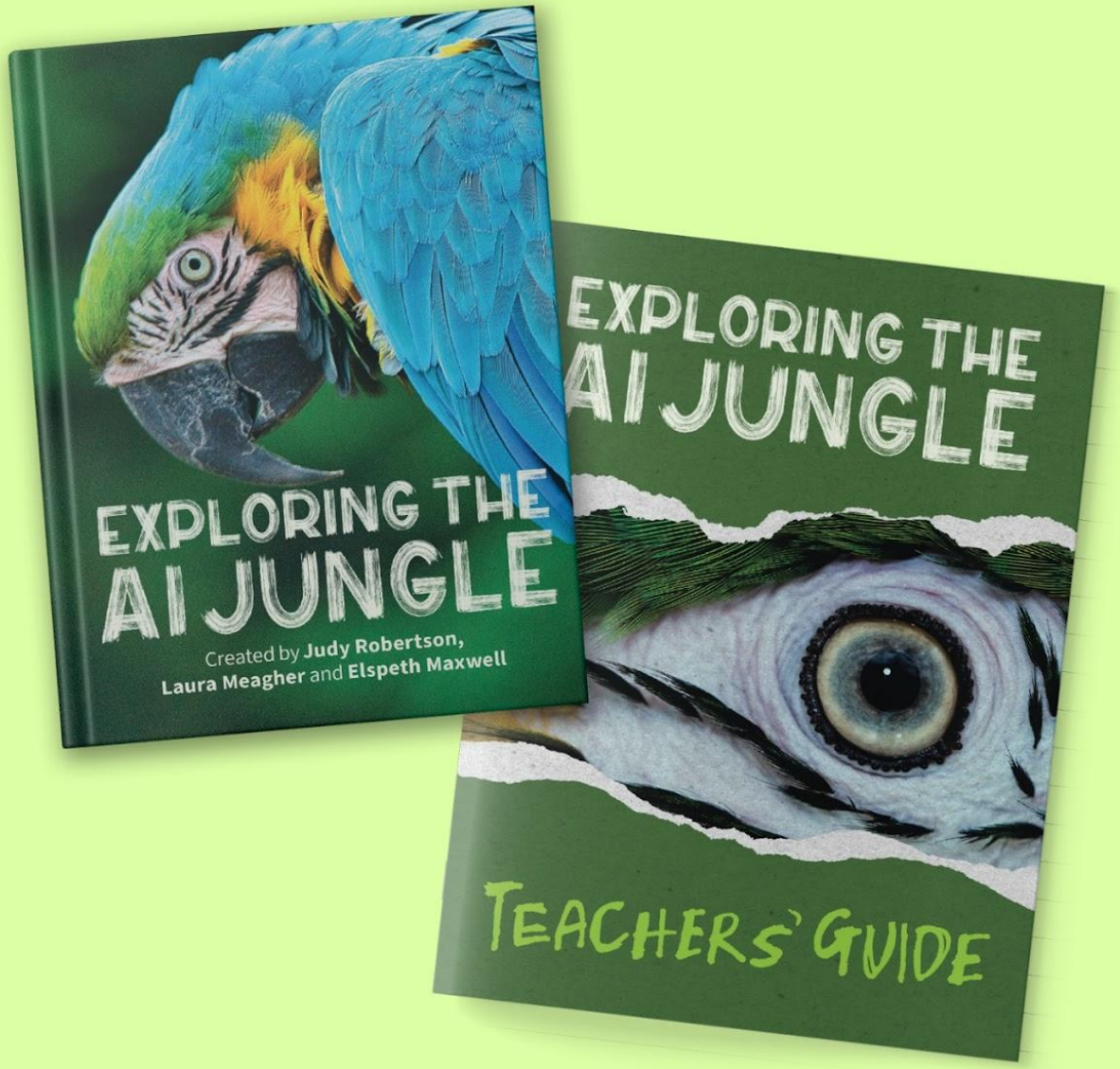
An AI sustainability board game!

Run a data centre
on Atlantis Island without
running out of power or water





What's At Stake?: Young People's Take on AI and Education
https://ai-and-education.shorthandstories.com/zine/index.html



Book, poster and teachers' guide (upper primary)
https://dataschools.education/exploring-the-ai-jungle/

Subject-specific resources

AI Teachers-in-Residence Model

- Teaching the Responsible Use to Support Learning strand needs significant subject and pedagogical expertise.
- We decided to co-create materials about AI with teachers from a range of disciplines.
- We selected the strongest applicants, rather than targeting specific subject areas.
- We paid for the teachers' time, either as backfill costs to the school or as personal payments (or both).

AI Teachers-in-Residence

Adam Llewelyn
Modern Studies, Falkirk

Ewen Glen
RMPS & Digital, Edinburgh

Anonymous
Biology/Science, Edinburgh

Matthew Mackie
Computing, Perth & Kinross

Kevin McPhee
ASN, Edinburgh

Louis Girvan
Music, Dumfries & Galloway

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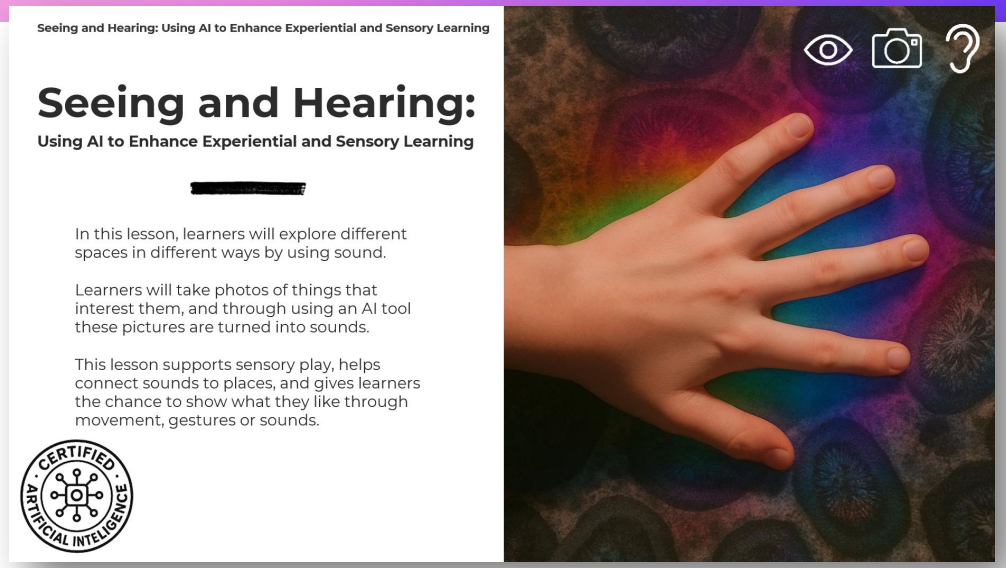
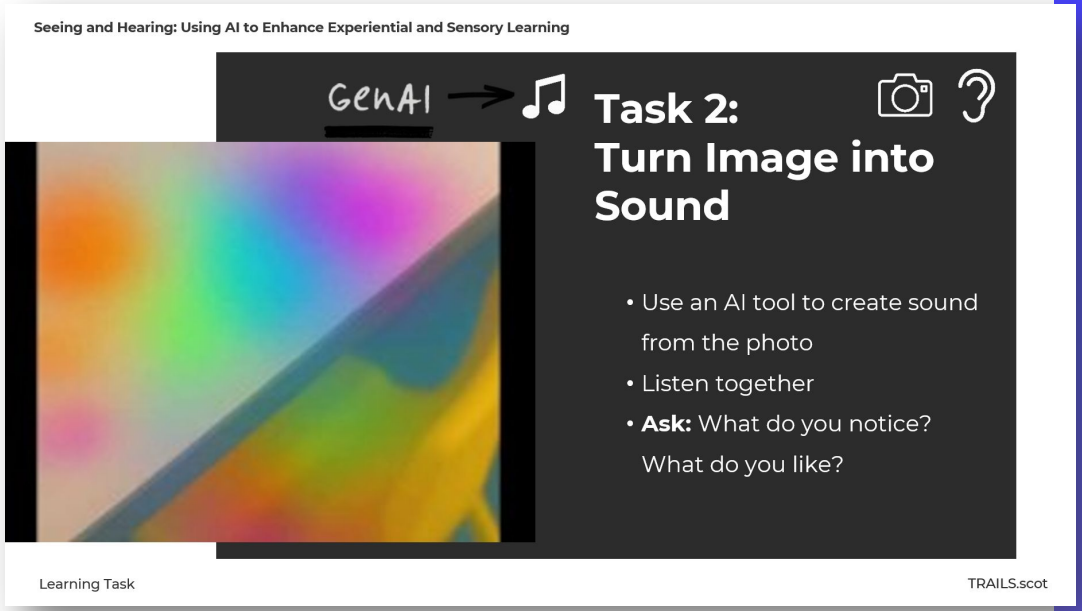
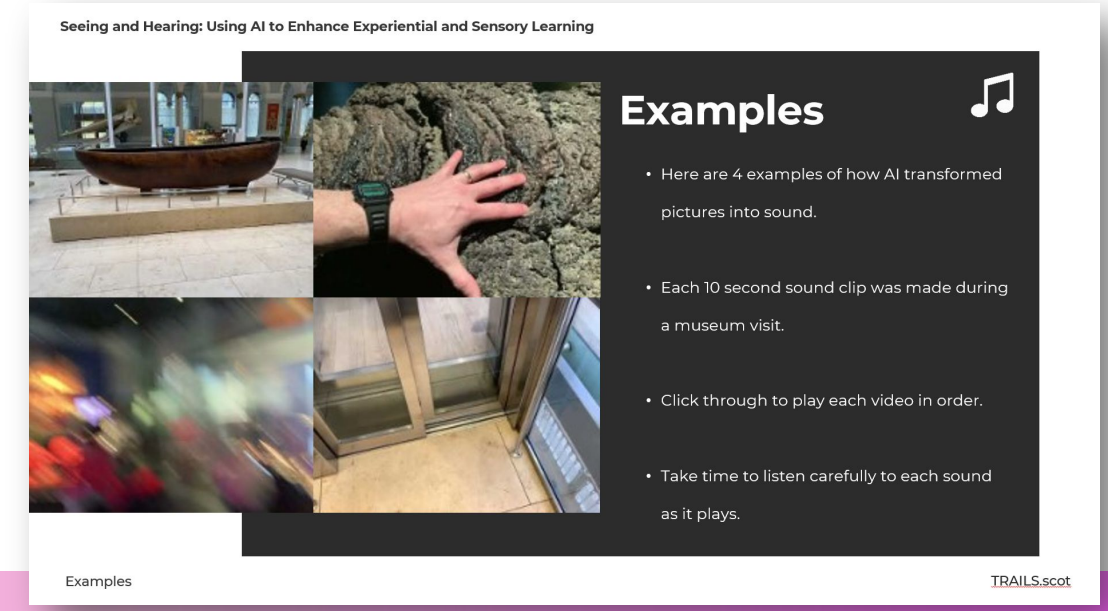
ASN Lessons


Kevin McPhee
ASN, Edinburgh







Here are our slides!

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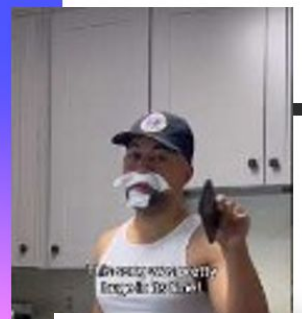
Music Lessons

What makes music *original*?



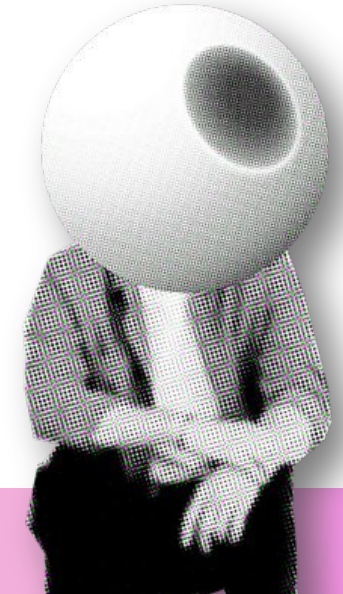
How many melodies are there?

Damien and Noah algorithmically generated all 8 notes melodies and put them on a hard drive – meaning that by law they own them.

What do you think? 🤔

- Does the fact that the melodies were algorithmically generated alter how much they own them?
- Should anyone "own" a melody? Is there a certain length of melody that this should kick in for?

Click icon to add picture



What about music generated by AI?

Click the notes to hear examples of AI generated music

There are many AI tracks being made and released now that this is a possibility.

What if an artist has a copyright claim over AI generated music? Is this different from the case of making a claim over other humans?

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CS Lessons


Matthew Mackie
Computing, Perth & Kinross

Impact of Midges in Scotland

- **Tourism Losses**: Midges have been estimated to cost Scotland's economy up to **£10 million** annually, as their swarms deter tourists, especially **outdoor enthusiasts** like **hikers** and **campers**.
- **Seasonal Disruption**: The midge season (**May to September**) overlaps with **peak tourism months**, causing many visitors to avoid or shorten their trips due to the discomfort of the insects.
- **Impact on Rural Communities**: In midge-heavy areas, local economies that rely on outdoor tourism can suffer, with fewer visitors and a decline in business during the summer months.
- **Ecological Role**: Despite their economic impact, midges play an important role in the ecosystem, providing **food for birds**, **bats**, and **fish**, which **supports other industries** like **fishing** and **wildlife tourism**.

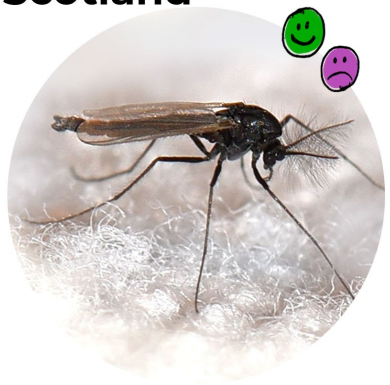
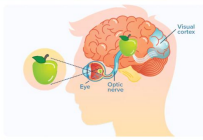


Image Recognition

The human brain has evolved to be incredibly good at **image recognition**.

Our brains process **vast amounts** of **visual data** almost **instantaneously**, helping us navigate the world efficiently.

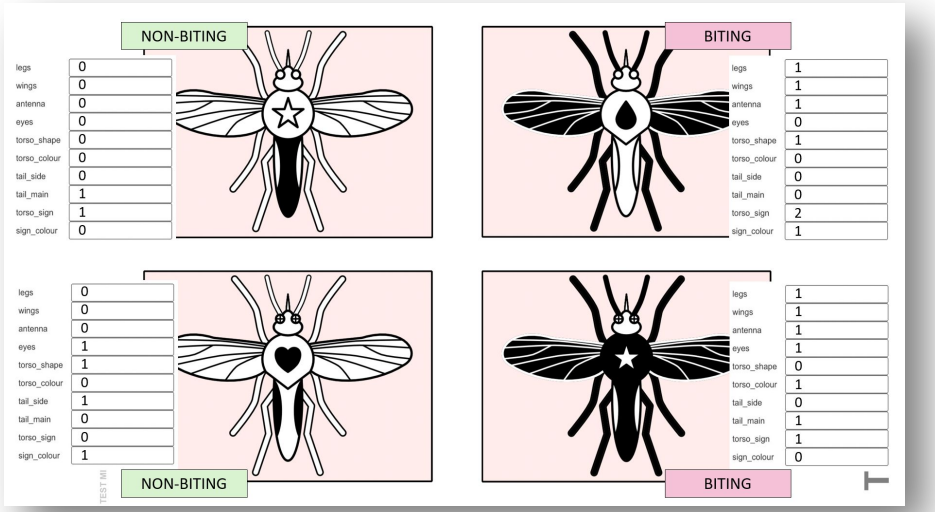


Face Recognition

Humans can recognise faces in just a few hundred milliseconds. Even when faces are partially obscured or shown at unusual angles, the brain is adept at identifying familiar faces.

Visual Scene Understanding

The brain can quickly process a complex visual scene and identify key elements, like distinguishing between different objects (cars, trees, etc.) in a cluttered environment. It only takes about 200 milliseconds for the brain to identify objects in a scene, even in a high-stakes context like driving.

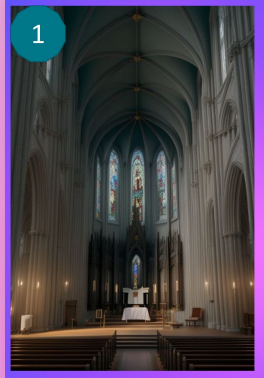


RMPS Lessons


Ewen Glen
RMPS & Digital, Edinburgh

Here are our slides!

Starter: Which of these images have been created by AI?



Check your learning

Success Criteria

- Consider if AI can be trusted to make moral decisions.
- Consider if AI can be used to promote a more just and compassionate society
- Analyse the benefits and drawbacks of using AI as a source of moral guidance.

Tell your partner...

One reason you think AI is trustworthy/ untrustworthy

One way AI could benefit society?

One consequence/ impact of using AI as a moral guide?

How is AI changing religious belief and practice?

The rapid rise of AI tools is already having significant effects on religious beliefs and practices. This includes...

Virtual congregations: AI tools enable the formation of virtual communities that transcend geographical boundaries, fostering spiritual connections through online worship, collaborative prayer, and communal learning, reshaping notions of fellowship and belonging.

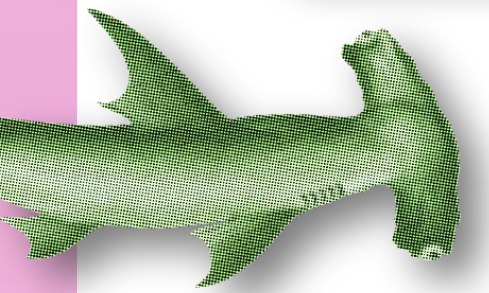

Image generated by Adobe Firefly

Task 1: Discuss the following questions with a partner/ group.

Q1: What might be some of the benefits/ drawbacks of self driving cars?

Q2. How might human bias creep into AI decision making?

Q3. Would you prefer an AI or a human to be behind the wheel if you were a passenger in a car? Explain your answer.



Unit Overview

Lesson 1 Learn about the developments of AI and the consequences for religious beliefs and practices

Lesson 2 Learn about the moral issues surrounding AI and if it can be trusted to make moral decisions.

Lesson 3 Learn about the philosophical questions arising from the development of AI

Task 1: Create your own Turing Test

Create a test to discover if you are talking to an AI or a human.

To complete this task, you could use one of the following AI chatbots.

Step 1 **Create 5 questions** you will ask an AI chatbot.

Step 2 **Ask a partner** your questions and record their answers.

Type your questions into the chat box and record the answers

Copilot

Step 3 **Ask an AI chatbot** your questions and record the answers. You will need to prompt it you are conducting a Turing Test.

Gemini

Go to https://gemini.google.com/. Type your questions into the chat box and record the answers

"Answer the questions in such a way as to convince the reader you are human not AI"

Type your questions into the chat box and record the answers

ChatGPT

TRAILS.scot

Resources

Atlantis Island Sustainability Game

Board Game will be coming soon. But for now, have a look at these Choose your own discussion slides that...

AI in Social Sciences

These lessons have been developed by Social Sciences Teacher Adam Llewellyn in collaboration with the TRAILS team. These lessons are...

Thanks

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