

Navigating AI in Education

A Cross-Subject Guide for Teachers and Educators



This resource supports teachers and educators in applying artificial intelligence (“AI”) literacy across subject areas. It identifies the opportunities and challenges that AI presents to educational settings and presents pathways to AI literacy that harness its benefits and reduce potential risks. This guide is a companion to the AI Literacy Framework: rather than repeating the framework’s competences and domains in full, it bridges them with classroom practice, making AI literacy actionable and practically applicable for primary and secondary teachers and educators.



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This document is a companion resource to the AI Literacy Framework (OECD, 2026). To learn more about the AILit Framework, its development, or the associated competences, please visit www.ailiteracyframework.org

About this Guide

This guide addresses AI literacy across six subject areas: Language Arts, Humanities and Social Studies, Mathematics, Science, Arts and Creative Disciplines and Computer Science. These subjects represent common components of primary and secondary curricula across many educational systems; however, this guide is not exhaustive. Each discipline offers entry points into AI literacy. Educators working in subjects not covered here will find that the approaches described will transfer readily.

Each subject section is organised around classroom experiences commonly associated with that discipline. For each experience, the guide illustrates the connection to AI literacy and provides a classroom example aligned with a framework competence, showing how that connection might take shape in practice.

This guide addresses primary and secondary education together. The depth and complexity of AI literacy instruction will differ across age groups, and educators should adapt content and questions to their learners' developmental stage and prior knowledge. Where differences in approach are especially relevant, the guide notes them.



Each subject section in this guide concludes with a set of Key Questions designed to support teachers in assessing and deepening learners' AI literacy. These questions can serve as discussion prompts, formative checks or reflective activities throughout a unit or lesson. They are organised as such:

“In the Moment”

questions encourage learners to observe and describe AI system behaviours as they encounter them, actively evaluating AI outputs through techniques such as crafting effective inputs or interpreting results.

“Reflective Use”

questions step back from the immediate interaction to examine the bigger picture of a learner's relationship with AI: not just what the output says, but what it means to rely on, trust, or be shaped by AI in their work and life.

“Exploring Further”

questions position learners as active shapers of AI systems. Learners consider not just how to use AI, but why it exists, who it serves, and how they might want AI to function differently.

Questions are differentiated across subject areas to reflect the specific content, vocabulary and concerns of each discipline. Teachers and educators are encouraged to adapt wording and difficulty to their learners' age and experience.

Opportunities and Challenges of Teaching AI Literacy

Introducing AI literacy across subject areas presents both significant opportunities and genuine challenges for teachers and educational systems. These opportunities and challenges are not unique to particular subjects, but may crosscut educational contexts and situations. This guide attempts to solve challenges where teachers and educators might not feel confident introducing AI literacy for their learners, or may not know how to integrate AI literacy competences within their classrooms.

Opportunities

Deepen Subject-Area Learning

AI literacy does not displace existing content; it enriches it. When learners examine how an AI system makes predictions using statistical methods, they are engaging with mathematical thinking. When they analyse an AI-generated historical account for accuracy and bias, they are deepening their understanding of historical events. Integrating AI literacy into subject areas creates opportunities for learners to engage with core disciplinary content in new and meaningful ways.

Develop Transferable Critical Thinking

The skills learners develop through AI literacy, including evaluating outputs critically, questioning assumptions, and distinguishing reliable from unreliable information, are transferable across all subjects and stages of life. AI literacy can be woven into existing instructional priorities. These priorities include longstanding skills like critical thinking, research techniques and ethical reasoning.

Support Learner Agency

Young people are already using AI tools for learning, creative expression, research and communication. Teaching AI literacy gives learners the conceptual vocabulary and critical tools to use these technologies intentionally. Learners who understand how AI systems work, including their capabilities, limitations and embedded assumptions, are better positioned to make informed choices about when and how to engage with them.

Prepare for Civic and Professional Life

AI systems shape the environments in which learners will live and work: hiring algorithms, medical diagnostics, content moderation, financial decision-making and public administration. Across all subject areas, AI literacy prepares learners not just to use these systems, but to evaluate and challenge them.

Challenges

Teacher Confidence and Professional Learning

A significant challenge to introducing AI literacy across subjects is teacher confidence, support and training. Many educators have not had opportunities to develop their own AI literacy and may feel uncertain about engaging with topics they perceive as highly technical. Educational systems can address this by investing in sustained professional learning that allows teachers to build knowledge incrementally, experiment in low-stakes environments, and share practice with colleagues. This guide is designed to be accessible regardless of a teacher's prior technical knowledge.

Disciplinary Connections

AI literacy does not yet have a clearly designated place in many national curricula. Teachers who wish to integrate it into existing subjects may face constraints around time, assessment requirements and curriculum relevance. This guide takes the approach of connecting AI literacy to existing curriculum topics rather than adding new content, to make integration as manageable as possible.

Rapidly Evolving Technology

AI tools and capabilities are changing quickly. Specific examples, tools and applications described in any resource, including this one, may become outdated. The conceptual foundations of AI literacy, namely understanding how AI systems work, developing habits of critical evaluation and engaging with ethical dimensions, are durable even as specific technologies change. Teachers should feel empowered to update examples and applications as the landscape evolves.

Equity and Access

Access to AI tools varies significantly across schools, regions and countries. Many of the classroom examples in this guide can be adapted for low-technology settings, for example: using thought experiments and case studies rather than live AI tools. Educational systems should ensure that AI literacy is treated as a right for all learners, not a privilege for the well-resourced, and that professional learning and resources are distributed equitably.

Language and Cultural Context

AI systems are not culturally neutral: they are built in particular contexts and reflect the languages, values, and assumptions of their developers. Teachers working in multilingual or non-English-speaking contexts may find that AI tools perform differently. This is itself a valuable observation for AI literacy; examining where and why AI systems fall short is as instructive as examining where they succeed.



Languages and Literacy

Writing, reading and communication are central to Language Arts, and AI tools are present across each of these areas. AI writing assistants can help learners draft, revise and refine text, but they also raise questions about authorship, voice and originality. Language Arts offers a natural setting for learners to engage critically with AI as both a creative tool and a subject of inquiry: What does it mean to write with AI? How can one recognise AI-generated text? What responsibilities do writers have when using AI assistance? These questions extend, rather than displace, existing curricular priorities around composition, comprehension, and information literacy.

Learning Connections

Writing and Composition

Writing instruction focuses on process: brainstorming, drafting, revising, and editing. AI tools can enter every stage of this process. When learners use AI to generate a first draft or suggest revisions, they encounter the same questions of craft that any writer faces: Is this the right word to use? Does this paragraph flow? Does this reflect my voice? AI literacy in writing and composition encourages learners to see AI as a tool with clear capabilities and limitations. They can compare their own drafts to AI-generated alternatives, identifying where their own voice and judgement contribute something AI tools cannot replicate.

CLASSROOM EXAMPLE: WRITING AND VOICE

Create with AI 3: Direct generative AI systems to elicit feedback, refine results and support reflection

Learners write a short personal narrative. They then prompt an AI tool to write a version of the same story. Comparing the two, learners identify what the AI captured, what it missed, and how voice and perspective differ between human and AI-authored text. They decide whether to revise their original draft in light of the comparison, articulating what makes their version distinctly their own.

Reading Comprehension and Literary Analysis

AI tools can summarise texts, identify themes and answer comprehension questions, but doing so removes the interpretive work that builds key reading skills. Learners who understand how AI summarises text – by recognising patterns in language rather than understanding meaning – can better evaluate when AI assistance is appropriate and when it undermines their own learning. Using AI-generated summaries critically, comparing them to one's own understanding, and identifying what was missed or misrepresented, develops both reading comprehension and AI literacy simultaneously.

CLASSROOM EXAMPLE: CRITICAL COMPARISON

Engage with AI 3: Evaluate whether AI outputs should be accepted, revised or rejected.

After reading a complex text independently, learners generate an AI summary and compare it to their own notes. They assess the AI's output by noting what aligns or differs, deciding what to accept, revise, or reject, and explaining why. The discussion surfaces both the content of the text and the nature of AI summarisation.

Research and Information Literacy

AI tools can rapidly produce background information, references and summaries, but they can also fabricate sources, present outdated information with confidence, and reflect the biases of their training data. Information literacy in the context of AI means learners must verify claims, cross-check sources, and understand that AI-generated information is not authoritative. These are natural extensions of existing research skills: evaluating sources, checking facts, and recognising perspective.



CLASSROOM EXAMPLE: **FACT-CHECKING AI RESEARCH**

Manage AI 3: Decompose a problem to determine when and how AI systems should be used to automate or augment tasks

Learners break a research task into stages, deciding where AI can support idea generation or initial information gathering and where independent verification is needed. They use an AI tool to begin their research, then check claims and sources, documenting what AI handled well and where human judgment was necessary.



Key Questions for Languages and Literacy

In the Moment

- Whose voice is in this text: Yours, AI or a mix? How can you tell?
- Is this information accurate? What would you need to check to know for certain?
- What words or phrases suggest this text may have been AI-generated?

Reflective Use

- How did using AI affect your writing process? Did it support or get in the way of your thinking?
- What does it mean to be the author of a piece if AI contributed to it?
- How would a reader know this text involved AI assistance, and does that matter?

Exploring Further

- How might widespread AI writing tools change what it means to be literate?
- Who benefits and who is disadvantaged when AI takes over routine writing tasks?
- What responsibilities do writers have when using AI-generated content?

Humanities and Social Studies

Humanities and Social Studies develop learners' capacity to understand human societies, historical change, civic life, and cultural diversity. AI is shaping each of these domains: from algorithmic curation of news and social media to AI-generated historical content and predictive systems in public administration. Learners in these classrooms can examine AI not just as a tool, but as a social and political phenomenon: Who designs AI systems? Who do they serve? How do they reflect existing assumptions and structures? These questions fit naturally within the disciplinary traditions of history, civics, geography, and media literacy. *Note: Educators working in Humanities and Social Studies will find significant overlap with the Language Arts section of this guide. Where curricula combine these areas, both sections can be used together.*

Learning Connections

Historical Inquiry and Source Evaluation

Historical thinking requires evaluating sources, recognising perspectives and distinguishing evidence from interpretation. These skills transfer directly to evaluating AI-generated historical content. AI can produce plausible-sounding historical narratives that contain errors, omissions, or culturally biased interpretations. Learners who approach AI-generated history with the same critical lens they apply to primary and secondary sources develop more robust historical thinking skills and a more sophisticated understanding of how AI systems can reflect and amplify existing narratives.

CLASSROOM EXAMPLE: EVALUATING AI HISTORICAL ACCOUNTS

Engage with AI 7: Analyse how well the use of an AI system aligns with ethical principles and human values.

Learners are presented with AI-generated accounts of a historical event alongside primary sources and secondary sources. They identify inaccuracies, missing perspectives, and evidence of bias in the AI account, and consider what factors in the training data might explain these gaps. They then discuss: what standards should apply to AI-generated historical content?

Media Literacy and Civic Engagement

AI systems play a significant role in shaping public discourse by recommending content and amplifying certain voices while filtering others. Understanding how these systems work is important for young people to participate meaningfully in democratic life. Learners can examine how algorithmic systems influence what information people encounter, and how the same event can be framed very differently depending on the platform and the user. This connects to existing media literacy work around recognising disinformation, understanding editorial choices, and building habits of verification.

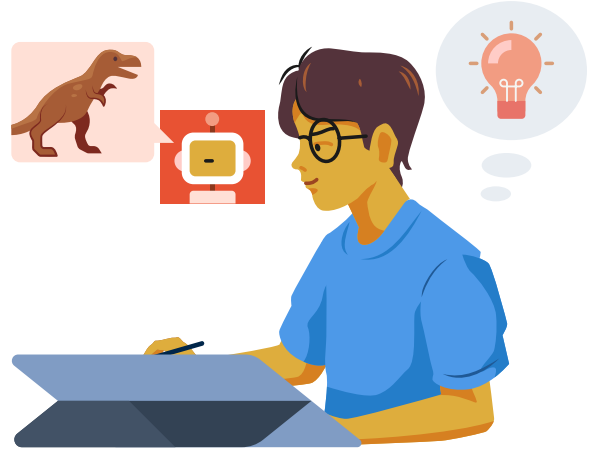
CLASSROOM EXAMPLE: ALGORITHMIC CURATION AND CIVIC LIFE

Engage with AI 4: Examine how predictive AI systems provide recommendations that can inform or limit perspectives.

Learners analyse examples of how AI-curated platforms surface different content to different users. They discuss how these systems decide what content to show, whose interests they serve and what information might be filtered from view. They consider what this means for informed citizenship and what responsibilities platforms and policymakers have.

Culture and Global Perspectives

AI systems are not neutral: they are built in particular places, by particular people and reflect the values and priorities of those contexts. Learners can examine how AI tools perform differently across languages, regions and cultural contexts, and consider what this means for larger questions of equity and access. The global digital divide shapes who has access to AI tools and whose data shapes how AI systems are trained. These questions sit at the heart of geography, development studies and global citizenship education.



CLASSROOM EXAMPLE: AI ACROSS LANGUAGES

Engage with AI 6: Explain how AI could be used to amplify societal biases.

Learners test an AI translation or language tool in a language other than English, or in a regional dialect, and evaluate the quality and nuance of the output. They discuss why AI performance varies across languages, what this reveals about whose knowledge is centred in AI development, and what the implications are for speakers of less-resourced languages.



Key Questions for Humanities and Social Studies

In the Moment

- What perspective or viewpoint does this AI-generated content reflect?
- What evidence would you need to verify this historical claim or interpretation?
- Whose voice or experience might be missing from this account?

Reflective Use

- How might the training data of this AI system reflect particular cultural or political biases?
- How does algorithmically curated information affect what people believe about current or historical events?
- What critical thinking skills do you already use that can help you evaluate AI outputs?

Exploring Further

- How do AI systems reflect and sometimes reinforce existing social inequalities?
- Who should have a say in how AI is used in civic and political life?
- How can communities maintain human agency and democratic accountability as AI systems become more prevalent?

Mathematics

Many of the concepts that drive AI systems are mathematical. Learners who understand algebra, statistics and computational reasoning can develop genuine insight into how AI systems function, not just how to use them. A core principle of mathematics education is that students should understand concepts well enough to evaluate answers independently. This principle applies directly to AI literacy: when learners can carry mathematics-related tasks themselves, they can verify what an AI produces and recognise where it falls short. The aim is not for AI to replace mathematical understanding, but for mathematical understanding to strengthen learners' capacity to evaluate AI.

Learning Connections

Algebra and Functions

A machine learning model is, at its core, a function that takes inputs and produces outputs. Learners who understand how functions work, including inputs, outputs, and the rules that connect them, can more readily grasp what a model does when it generates a prediction. Writing and reasoning about functions builds the conceptual vocabulary learners need to move from passive users to informed evaluators of AI systems.

CLASSROOM EXAMPLE: FUNCTIONS AND MODELS

Engage with AI 4: Examine how predictive AI systems provide recommendations that can inform and limit perspectives.

Learners define a simple function, such as calculating the cost of an order based on quantity and price, and trace the input-output relationship step by step. They then compare this to how an AI recommendation system takes user inputs and produces a recommendation. They discuss the following questions: What goes in? What comes out? What does the model decide, and how is that similar to or different from the mathematical function they wrote?

Statistics, Probability and Data

Statistics provides the mathematical language for understanding how AI learns from data: distributions, averages, variance, correlation, and the concept of minimising error. Learners who are comfortable with descriptive statistics can critically evaluate AI outputs, asking not just what the model predicts, but how confident it is, what variability exists in the underlying data, and what happens when the training data is biased or incomplete. The idea that a model improves by minimising the gap between its predictions and true values maps directly onto statistical reasoning learners encounter in the classroom.

CLASSROOM EXAMPLE: DATA, PREDICTION AND BIAS

Shape AI 3: Design AI systems with attention to how data sources, selection and information flow influence behaviour and outputs.

Learners collect data from their class, such as hours of sleep and test performance, and calculate mean, median, and range. They then explore how an AI model might use similar data to make predictions and discuss what would happen if the training data were collected from a different group or if certain types of learners were underrepresented. This connects statistical reasoning to questions of algorithmic fairness.

Sorting and Search Algorithms

Sorting and search algorithms are foundational to both mathematics and computing, and they underpin many AI applications. When learners write, trace or compare sorting algorithms, they gain insight into the deterministic, rule-based logic that forms the basis of many AI systems. Comparing algorithms by their efficiency also introduces ideas about trade-offs that are central to real-world AI design decisions.

CLASSROOM EXAMPLE: ALGORITHMIC EFFICIENCY

Manage AI 2: Choose an appropriate AI approach for a task by comparing how different AI systems operate and what they are best suited to do.

Learners implement and compare two sorting algorithms on the same dataset. They measure how many steps each requires and discuss why efficiency matters when AI systems process very large datasets. They then consider: when do small differences in algorithmic design become significant at scale?

Matrix Operations and Neural Networks

For learners who have studied matrix multiplication, a direct connection exists to the mathematical structure of neural networks. The transformation of data as it passes through the layers of a neural network is, at its base, a series of matrix multiplications. Learners who understand this connection can approach neural networks as a comprehensible extension of mathematics they already know, rather than as an impenetrable process.

CLASSROOM EXAMPLE: MATRICES AND NEURAL NETWORK LAYERS

Shape AI 1: Investigate how an AI system is intended to work, whom it is designed for and what its limitations are.

Learners perform matrix multiplication by hand on small datasets and trace how the operation transforms input values. They then view a simplified visualisation of a neural network layer and connect what they observe to the matrix operations they completed. They discuss: What happens to the data at each layer? How does the network learn by adjusting these values?



Key Questions for Mathematics

In the Moment

- What mathematical operation is the AI system likely performing here?
- How does the AI's representation of the problem (tables, equations, graphs, explanations) compare to your own?
- How would my classmates approach this problem differently?

Reflective Use

- Where does the AI's answer differ from yours? What mathematical explanation might account for the difference?
- How can your own mathematical reasoning skills help you decide whether an AI-supported approach is useful?
- What assumptions does this model make, and how do those assumptions affect the outcome?

Exploring Further

- How do the mathematical properties of a training dataset, including its size, distribution and completeness, affect what an AI model can learn?
- What does it mean, mathematically, for a model to learn from data?
- How can mathematical reasoning be used to identify when an AI result is unreliable or unfair?

Science

Science is built on empirical inquiry: forming hypotheses, collecting data, analysing results and revising understanding in light of new evidence. AI is a growing tool in scientific research, from climate modelling to genomic analysis to medical imaging. This makes science a natural context for learners to engage with AI as both a research tool and a subject of critical inquiry. A central question for AI literacy in science is the relationship between AI-generated predictions and empirical evidence: when does AI support scientific understanding, and when might it replace or obscure it?

Learning Connections

Scientific Inquiry and Hypothesis Generation

The scientific method, forming a hypothesis, testing it, and revising based on evidence, shares features with how AI models generate and refine predictions. Learners can use AI tools to assist with generating hypotheses or identifying patterns in data, while maintaining the critical questioning that defines scientific thinking: Is this result reproducible? What variables might explain this pattern? What would disprove this hypothesis? AI-generated hypotheses should be treated as starting points for inquiry, not as conclusions.

CLASSROOM EXAMPLE: HUMAN AND AI HYPOTHESIS GENERATION

Create with AI 1: Use AI systems to explore new perspectives and approaches that build upon original ideas.

Learners design a simple experiment, such as measuring plant growth under different light conditions. Before collecting data, they generate their own hypotheses and also ask an AI tool to suggest hypotheses. After collecting data, they evaluate which hypotheses were supported and discuss whether the AI's suggestions were scientifically sound, and why or why not.

Data Analysis and Environmental Science

Large-scale environmental monitoring depends on AI systems that analyse satellite imagery, sensor data and climate models to identify patterns. Learners can explore how AI is used to detect changes in ecosystems, predict weather events or monitor air quality, while considering how the quality of input data affects the reliability of predictions. This connects directly to subject area content on ecosystems, climate change, and scientific data analysis.

CLASSROOM EXAMPLE: ENVIRONMENTAL DATA AND AI PREDICTIONS

Shape AI 3: Design AI systems with attention to how data sources, selection and information flow influence behaviour and outputs.

Learners access publicly available environmental data, such as temperature records or air quality indices, and use visualisation tools to identify trends. They then explore how AI systems use similar data to generate predictions and consider: what would happen if the data contained errors or gaps? How would a scientist verify an AI-generated environmental prediction?

Biology and Medicine

AI is used in biological research and medical diagnostics, including identifying patterns in medical images, predicting protein structures and supporting drug discovery. Learners in biology can explore how AI systems are trained on biological and clinical data and consider both the promise and the limitations of AI in these contexts, including questions about accuracy, the importance of diverse training data and the role of human clinical and scientific judgement.

CLASSROOM EXAMPLE: AI IN MEDICAL IMAGING

Shape AI 1: Investigate how an AI system is intended to work, whom it is designed for and what its limitations are.

Learners examine examples of AI-assisted medical imaging, for example AI detection of skin conditions from photographs. They discuss how the system is trained, what kinds of errors it might make and how the diversity of the training data could affect its performance across different patient populations. They consider: what are the consequences of these errors, and who bears the risk?

Energy, Resources and the Environmental Footprint of AI

Training large AI models requires significant computational resources and energy. This connects to learning about energy use, environmental impact and sustainability, and provides a concrete example of how technological choices have consequences beyond the immediate context of use. Learners can investigate the environmental costs of AI development and consider what responsible design and use look like from a sustainability perspective.

CLASSROOM EXAMPLE: THE ENERGY COST OF AI

Engage with AI 5: Compare how AI systems consume energy and natural resources.

Learners research the energy consumption of training a large AI model and compare it to the energy use of familiar activities, for example powering a home for a year or driving a car across a country. They create an informational summary explaining these comparisons to a general audience. Discussion: How should this information affect decisions about when and how to develop or deploy AI systems?



Key Questions for Science

In the Moment

- Does this AI-generated result match the pattern you observed in your own data?
- What variables might the AI be accounting for that you have not yet considered?
- How would you design an experiment to test whether this AI prediction is accurate?

Reflective Use

- When should a scientist trust an AI model's output, and when should they question it?
- How does the quality and diversity of training data affect the reliability of a scientific AI model?
- What does it mean to replicate or independently verify a finding that was generated by an AI?

Exploring Further

- How is AI changing the pace, scope, and nature of scientific discovery, and what risks does this introduce?
- What ethical responsibilities do researchers have when deploying AI systems in scientific or medical contexts?
- How can communities ensure that AI systems used in science and medicine serve all populations equitably?

Arts and Creative Disciplines

Generative AI systems can produce images, music, text, and video, drawing on vast collections of human creative work. Used thoughtfully, AI can push learners' creative thinking, introduce unexpected directions and allow for modes of expression that might not otherwise have been accessible. Used without critical attention, AI can also obscure questions about authorship, consent, and originality that arts education exists to engage. What does authorship mean when a creative collaborator has learned from millions of human works, often without attribution? What constitutes originality? Who owns what is created? These questions are not peripheral to arts education; they are central to it.

Learning Connections

Visual Arts and Image Generation

Generative image tools raise immediate questions about artistic process, intention, and authorship. When an AI tool produces an image, it draws on patterns from a large corpus of human-created art, often without credit or compensation to the original artists. Learners can examine these questions while also exploring how generative AI tools might serve as a starting point for their own creative work: as a source of inspiration, a rapid prototyping tool, or a collaborator whose suggestions they accept, reject, and transform.

CLASSROOM EXAMPLE: HUMAN, AI AND CO-CREATED ART

Create with AI 4: Analyse how AI can safeguard or violate content authenticity and intellectual property

Learners are presented with examples of art created entirely by a human, generated by an AI system, and co-created by a human and AI together. They discuss: What choices did the human make in each case? Who should be credited as the artist? What should copyright protect? They then create their own work and document the choices they made throughout the process.

Music and Composition

AI music generation tools can produce melodies, harmonies, and full compositions based on prompts or existing musical examples. This raises questions in music education about what it means to compose, interpret and perform, and about how AI tools might be used as compositional aids without replacing the human musical judgement that is central to music education. Learners can explore AI as a compositional partner while critically evaluating what it contributes and what it cannot contribute to the creative process.

CLASSROOM EXAMPLE: AI AS COMPOSITIONAL PARTNER

Create with AI 3: Direct generative AI systems to elicit feedback, refine results and support reflection

Learners compose a short melody and then use an AI tool to generate a harmonic accompaniment or variation. They evaluate the AI output against their musical intentions, noting what works, what does not, and what they would change, before deciding whether and how to integrate elements into a final composition. Reflection: What did the AI contribute? What could only they contribute?

Ethics, Authorship and Intellectual Property

AI raises shared ethical questions across all creative disciplines: Did artists consent to having their work used as training data? Who holds rights over AI-generated work? What does authenticity mean when creative outputs are machine-generated? These questions connect to broader discussions about intellectual property, cultural heritage and the rights of creators. Engaging with them develops the ethical reasoning and sense of creative responsibility that arts education aims to cultivate.

CLASSROOM EXAMPLE: DEVELOPING A CREATIVE ETHICS STATEMENT

Engage with AI 7: Analyse how well the use of an AI system aligns with ethical principles and human values

Learners research a specific case in which AI-generated art or music has been commercially released, entered into a competition, or used without attribution to source artists. They analyse the questions raised by the case, including consent, attribution, fairness, and impact on working artists, and develop a class statement articulating what fair and ethical AI use in creative disciplines should look like.



Key Questions for Arts and Creative Disciplines

In the Moment

- What did you create, and what did the AI generate? Where is the line between the two?
- Does this output reflect your creative intention? What would you change, and why?
- Can you tell the difference between AI-generated and human-created work in this example? What signals give it away?

Reflective Use

- How did using AI affect your creative process? Did it expand your thinking or constrain it?
- What makes this work yours, even if AI contributed to it?
- How do you feel about the fact that AI systems may have learned from artists who did not consent to this use?

Exploring Further

- What should the legal and ethical rules around AI-generated creative work look like?
- How might AI tools change who has access to creative expression, and what might be gained or lost?
- What role should human judgement, lived experience, and intentionality always play in creative work?

Computer Science

Computer Science (also known as Informatics) provides the foundational technical understanding of how AI systems are built and how they function. Computer Science classrooms offer learners the opportunity to move from passive users to informed designers and evaluators of AI technology. Topics across common Computer Science curricula, including algorithms, programming, data and ethics, connect directly and concretely to AI literacy in ways that make seemingly- mysterious systems comprehensible, and therefore open to critical scrutiny.

For learners in technology-oriented educational pathways not categorised as formal Computer Science courses, the learning connections below are equally relevant. The conceptual links between programming logic, data literacy and AI are transferable across vocational and applied computing contexts.

Learning Connections

Algorithms and Computational Thinking

Understanding algorithms, the step-by-step processes for solving problems, is foundational to understanding AI. Learners who can trace, write and evaluate algorithms can demystify AI for themselves and others: they know that AI systems behave as a result of programmed processes and mathematical operations. Computational thinking skills, including decomposition, pattern recognition, abstraction, and generalisation, are precisely the skills learners need to reason about AI systems and evaluate their outputs.

CLASSROOM EXAMPLE: RULE-BASED VS. MACHINE LEARNING CLASSIFIERS

Manage AI 2: Choose an appropriate AI approach for a task by comparing how different AI systems operate and what they are best suited to do.

Learners trace a rule-based classification algorithm, for example identifying spam email based on keyword rules they design themselves. They compare this to a description of how a machine learning classifier works on the same task. Discussion: What is the same? What is different? Where does the programmer make explicit decisions, and where does the system learn from data? When might each approach be more appropriate?



Programming, Functions and Control Flow

Writing code and understanding control flow, including functions, loops and conditionals, helps learners understand that AI behaviour is programmed and rule-based at its core. Learners who have written their own functions can more readily grasp the idea of a model as a function that takes inputs and produces outputs. Programming & Functions is among the topics with the tightest links to AI literacy: once learners understand what a function does, and what it cannot do, they have a foundation for evaluating AI systems rather than treating them as black boxes. Exposure to libraries and APIs extends this, preparing learners to interact with AI tools in a technically informed way.

CLASSROOM EXAMPLE: FROM FUNCTIONS TO MODELS

Shape AI 2: Evaluate AI systems using defined criteria, expected outcomes, and user feedback.

Learners write a simple function that classifies inputs based on rules they define, for example categorising temperatures as cold, moderate, or hot. They then explore how a pre-trained model classifies similar inputs and compare the two approaches: Where does the rule-based function succeed or fail? Where does the model perform differently? What does this reveal about the strengths and limitations of each approach?

Data Representation and Machine Learning

Machine learning systems learn from data, so understanding how data is collected, represented, and structured is essential to understanding AI. Topics in data representation, including data types, file formats, and databases, connect directly to how AI systems process information. Learners can explore how the same information can be represented in different ways and how these choices affect what a system can learn. Understanding data structures also makes visible the labour and decisions involved in creating training datasets, which are often presented as neutral but always reflect choices about what to include, what to exclude and how to categorise.

CLASSROOM EXAMPLE: WHAT IS IN A DATASET?

Shape AI 3: Design AI systems with attention to how data sources, selection and information flow influence behaviour and outputs.

Learners examine a real-world dataset, for example a publicly available set of labelled images or text, and analyse: How was this data collected? What categories were used? What is missing or underrepresented? They consider how these characteristics would shape a model trained on this data and whose perspectives and experiences would be reflected or excluded in the model's outputs.

Ethics, Bias and Societal Impact

Ethics is embedded across Computer Science curricula, and AI introduces specific new dimensions: algorithmic bias, privacy, surveillance, automated decision-making, and the consequences of systems that operate at scale. Learners in Computer Science are positioned not just to understand these issues as observers, but to consider them as designers. What choices in data collection, model architecture and deployment could address or exacerbate harm? This positions learners as responsible creators, not only critical users.

CLASSROOM EXAMPLE: INVESTIGATING ALGORITHMIC BIAS

Shape AI 4: Improve AI systems to address and promote well-being and societal benefit.

Learners investigate a documented case of algorithmic bias, for example facial recognition systems that perform with significantly lower accuracy on certain demographic groups. They analyse how the bias arose, what the real-world consequences were, and what changes to the training data, system design or deployment context could have addressed it. They then discuss: who is responsible -, the data collectors, the system designers, the deployers, or the regulators? How can we design and deploy AI systems with respect to accountability and fairness?



Key Questions for Computer Science

In the Moment

- What does this AI system take as inputs, and what does it produce as outputs? What happens in between?
- What rules or patterns is the system using to make this decision or prediction?
- How would the output change if the training data were different?

Reflective Use

- How is this AI system similar to a function or algorithm you have written yourself? How is it different?
- Where does human judgement enter the design of this system, and where has it been automated away?
- What assumptions are built into this system, and under what conditions might they cause it to fail?

Exploring Further

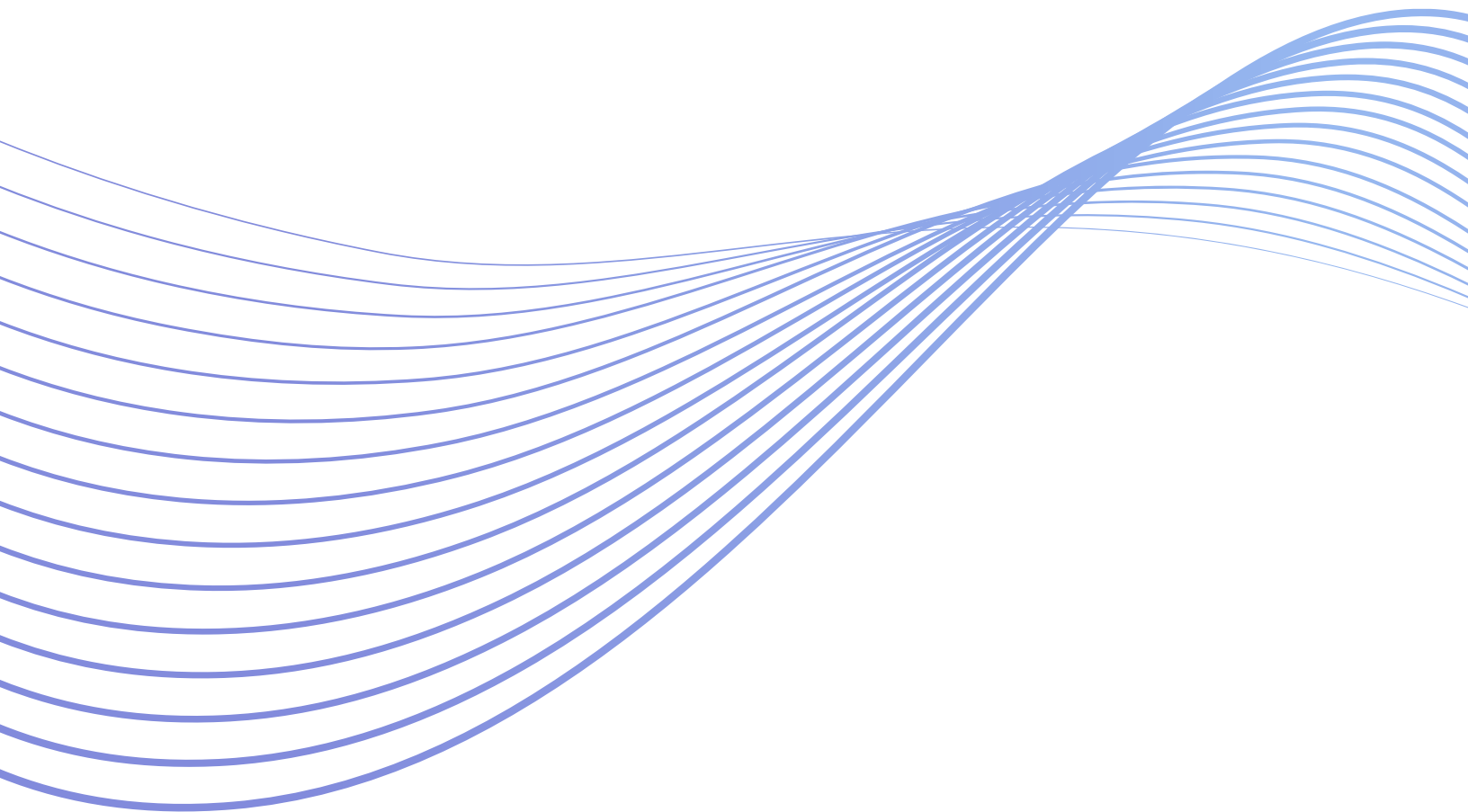
- How would you redesign this AI system to better serve all users, including those currently underserved by it?
- What responsibilities do designers and developers have when they build systems that affect people's lives?
- How do choices made in data collection and model design reflect values, and whose values are centred?

Conclusion: AI Literacy as a Shared Responsibility

AI literacy develops through sustained, intentional practice across disciplines. It is not achieved through isolated instruction, but through repeated engagement, reflection and meaningful application. The subject areas addressed in this guide offer distinct and complementary entry points: where mathematics illuminates the mechanics of AI systems, humanities develops the critical and civic frameworks to evaluate them, and arts education raises the ethical and creative questions that technical disciplines alone cannot answer.

Teachers and educators remain central to this work. Through guided exploration, sound pedagogy and trusting relationships with learners, educators ensure that AI literacy is more than a set of technical skills. It becomes a foundation for learners to navigate, question and shape the technologies in their lives. This guide is a starting point, not a comprehensive or final map. Every subject area, classroom and community offers its own entry points to and perspectives on AI literacy. The educators best placed to identify and develop those entry points are the ones who know their learners, their contexts, and their communities.





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