# AI Terms to Know

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Introduction

In collaboration with the B.C. education sector, a framework has been developed to facilitate thoughtful consideration and decision-making processes for the integration of AI tools into B.C.'s K-12 schools. The framework is structured into seven distinct categories:

- Ethical Uses
- Needs and Impacts
- Accessibility and Usability
- Integration and Compatibility
- Data Security and Privacy
- Teaching and Learning
- Inclusive Learning

For more information, please explore *Considerations for Using AI Tools in K-12 Schools.* Detailed considerations for each category are provided there, offering valuable insights to support a comprehensive and informed approach to using AI to meet both the business and learning needs of education.
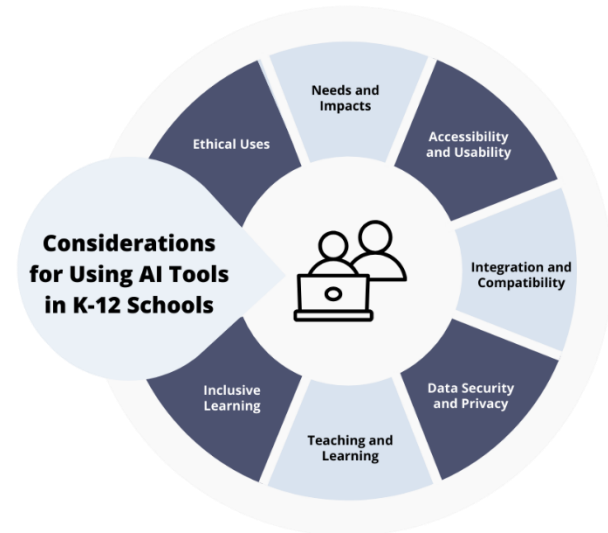
Before embarking on decision-making processes about the use of AI in education, it's essential to establish a shared understanding of AI terms. Cultivating AI literacy skills among decision-makers is a pivotal first step in making informed decisions about integrating AI in BC classrooms. This shared knowledge empowers the educational community to engage in informed discussions, articulate needs and concerns, and collaboratively shape procedures and policies that meet the diverse needs of all school district employees, as well as students.

The following glossary, in reader-friendly language, has been developed to help support the start of this collective learning process, ensuring that thoughtful, responsible, and student-centred choices are made, prioritizing the enhancement of teaching and learning experiences.

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Glossary

AI hallucination is a phenomenon in which a large language model (LLM)—often a generative AI chatbot or computer vision tool—perceives patterns or objects that are nonexistent or imperceptible to human observers, creating outputs that are nonsensical or altogether inaccurate. Often these hallucinations appear credible but are entirely fabricated.

An **AI model** is a neural network (defined below) trained on a specific set of data. Some models are trained on diverse data, while other models may focus solely on specific datasets like medical imaging data.

AI safety is a field of study focused on making sure AI systems operate safely. This includes preventing issues like providing instructions for creating dangerous viruses or avoiding scenarios in which AI systems take control of other systems.

> A sub-area of AI safety, **AI alignment**, concentrates on ensuring that AI systems' values align with human values. This includes balancing viewpoints, avoiding racial bias, and considering ethical, moral, and legal aspects that may vary across different countries and/or regions.

Algorithms are step-by-step procedures or sets of rules designed to solve specific problems or complete tasks. Think of them as a kind of recipe for computers to follow when executing a task. In the context of AI, algorithms are crucial for enabling machines to make decisions and perform tasks systematically. They are the heart of AI, guiding how data is processed and transformed into useful information. For instance, search engine algorithms determine the order of search results based on relevance and popularity.

An **application programming interface (API)** is a mechanism that enables two software components to communicate with each other using a set of definitions and protocols. For example, the weather bureau's software system contains daily weather data. The weather app on your phone "talks" to this system via APIs and shows you daily weather updates on your phone.

Artificial general intelligence (AGI) is a theoretical pursuit in the field of AI research aimed at developing AI with a human level of cognition, including the ability to self-teach. There is debate about whether these types of models will ever be possible.

Artificial intelligence (AI) is a machine's ability to perform the cognitive functions we usually associate with human minds, such as perceiving, reasoning, learning, interacting with an environment, problem-solving, and even exercising creativity. AI technologies are commonly used today, including things like voice assistants on your phone, customer service chatbots, and recommendations on streaming services.

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Artificial intelligence in education (AIED) involves the integration of artificial intelligence technologies or computer programs in educational settings to aid in learning, teaching, and systems processes. It encompasses diverse applications, such as student-focused AIED for learning experiences, teacher-focused AIED to support educators in planning and instruction, and institution-focused AIED to enhance overall educational systems and administrative functions.

Artificial super intelligence (ASI) refers to a hypothetical system with intellectual capabilities that surpass those of the most intelligent human across all areas of knowledge and cognitive tasks. This level of artificial intelligence would exhibit understanding, problem-solving, and learning that exceeds the highest human proficiency in every domain.

Automation involves using technology to carry out tasks with minimal human intervention. In AI, automation often refers to machines or systems performing tasks that would otherwise require human effort. An example of automation is in manufacturing, where robots are used to assemble products on assembly lines, reducing the need for human labour.

Bias happens when an algorithm's result is influenced in favour of or against a particular idea. It occurs as a result of incorrect assumptions in an algorithm, leading to systematic errors. For example, if an algorithm has information only on apples and no other fruits, it may assume that apples are the only type of fruit. Bias can cause AI tools to provide certain responses more frequently, even if those answers may be incorrect.

Big data refers to massive datasets that are too large to be processed using traditional computing methods. Through data mining, advanced AI software can analyze these large databases to identify patterns and draw conclusions. Access to big data enables AI solutions to become more intelligent and deliver more human-like interactions.

A **black box** describes an AI system whose internal workings are inaccessible. Humans cannot determine how a black box AI arrives at a specific decision—only inputs and outputs can be observed. Several common generative AI tools are examples of black box AI; it's impossible to predict which answer it will provide and why it selects a particular answer.

Chatbots are AI-powered computer programs designed to simulate human conversation. They can answer questions, provide information, and assist users in real time.

In the realm of generative AI systems, **context** refers to the limit on input and output size the system can handle. **Tokens**, roughly equivalent to four characters or three-quarters of a word, define this limit. For example, ChatGPT originally allowed 1,024 tokens, meaning it could process around 750 words before exhibiting unpredictable behaviour.

Computer vision is an AI field that enables computers to interpret and understand visual information from the world. This technology powers facial recognition systems and medical image analysis, and even helps self-driving cars navigate by identifying traffic signs and pedestrians.

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Conversational AI is a type of technology, like a chatbot, that simulates human conversation, allowing users to interact with and talk to it.

Data mining involves analyzing large databases to generate new information. Through data mining, AI tools become more effective at solving a wide variety of problems.

A **decision tree** is a structure of responses that helps a chatbot provide specific answers to questions. By asking a series of questions, known as branches, chatbots use a decision tree to narrow down a user's goal and provide them with an appropriate response.

Deep learning is a subset of machine learning that uses neural networks with multiple layers to process and analyze data. It is often used in complex tasks like image and speech recognition. For example, deep-learning algorithms enable self-driving cars to recognize and respond to various objects on the road.

A **deepfake** is a photo, video, or audio recording in which someone's likeness has been altered by AI. Deepfakes are often used maliciously to defame or spread misinformation.

Educational ethics in the context of AI in education encompasses guiding principles for the responsible integration of artificial intelligence technologies within educational settings. It emphasizes a human-centric approach, aiming to enhance the learning experience, while also respecting cultural diversity and considering and addressing the distinct needs of staff, teachers, and students.

Generative AI is a broad, deep-learning AI algorithm that can be used to create new content, including audio, code, images, text, simulations, and videos. Generative AI can be used to create text, graphics, and videos in a matter of seconds.

Human in the loop is a concept that ensures that all decisions made and actions taken by AI systems have human oversight.

Interactive voice response (IVR) allows telephone users to speak with a computer-operated system that recognizes what they're saying. When you call a business and encounter an automated reply with a pre-recorded menu of options, you're interacting with an IVR system.

Internet of Things (IoT) refers to the network of interconnected physical objects embedded with sensors, software, and other technologies that enable them to collect and exchange data. Examples of IoT devices are smartboards, smart watches, or wearable fitness trackers.

Jailbreaking refers to the process of removing restrictions or limitations imposed by a device or software, often to gain access to features or functionality that were previously unavailable.

A **knowledge base** is a set of data available for a program to draw on to perform a task or provide a response. The larger the knowledge base an AI application has access to, the broader the range of problems it can solve.

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Large language models (LLM**)** are a deep-learning algorithms that can recognize, summarize, translate, predict, and generate text and other forms of language-based content by pulling from large datasets.

Machine learning is an aspect of AI in which computers learn from data and improve their performance over time without being explicitly programmed. Imagine a recommendation system like music streaming services suggesting songs based on what you have listened to before—that is machine learning in action.

Natural language processing allows computers to understand and generate human language. Think of chatbots that can have conversations with us or translation apps that help us communicate with people who speak different languages—these are powered by natural language processing.

A **neural network** is a system of interconnected neurons that work together to process information. It's inspired by the structure of the human brain. In AI, these networks learn from data, adjusting their connections (weights and biases) to make accurate predictions or classifications.

> **Weights** are numerical values assigned to the connections between neurons in a neural network. These values determine the strength of the connections. During the training process, the weights are adjusted to minimize errors and improve the model's accuracy in making predictions.

> **Biases** are additional values in a neural network that allow it to account for situations where all inputs may be zero or have no impact. They help the model learn more flexible patterns and make predictions that are not solely dependent on the input data. Like weights, biases are adjusted during training to optimize the model's performance.

Neurons are the basic units in a neural network. They function like tiny decision makers, taking in information, processing it, and producing an output.

Non-generative (or traditional/discriminative) AI focuses on performing a specific task intelligently. It refers to systems designed to respond to a particular set of inputs. Imagine you're playing computer chess. The computer knows all the rules; it can predict your moves and make its own moves based on a pre-defined strategy. It's not inventing new ways to play chess but selecting from strategies it was programmed with.

Parameters are like the building blocks of an AI model. They determine how big and sophisticated the model is by representing the weights and biases linked to the neurons in its neural network. If a model has more parameters, it becomes more intricate and capable, but it often needs more training data to function effectively. (Weights, biases, neurons, and neural networks are defined above.)

Predictive analytics refers to the use of AI to collect and use data to predict future trends and events. An example of predictive analytics is when a streaming service recommends additional shows and movies based on a person's viewing history.

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Robotics involves the design and construction of machines that can perform tasks autonomously or semi-autonomously. AI is often integrated into robotics to enable machines to learn from their environment and make intelligent decisions.

User interface is the point of human-computer interaction and communication in a device. This can include display screens, keyboards, a mouse, and the appearance of a desktop. It is also how a user interacts with an application or a website.

Virtual reality (VR) immerses users in a computer-generated environment, while **augmented reality (AR)** overlays digital elements on the real world. AI can enhance VR and AR experiences by creating more realistic simulations or by providing contextual information. In education, VR can take students on virtual field trips, while AR can bring interactive content into textbooks.

Important note: The terms defined in this document are part of a constantly evolving landscape. The list of terms is not exhaustive; it is intended to serve as a starting point. You may encounter additional terminology and concepts that require further research and learning.