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Idaho Content Standards for 9-12 Artificial Intelligence

Idaho Department of Education
Content and Curriculum | 9-12 Artificial Intelligence

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THE ROLE OF STANDARDS

The Idaho Content Standards define what all students are expected to know and be able to do. They do not define how teachers should teach the standards. A great deal is left to the discretion of local school districts, charters, teachers, and curriculum developers. No set of grade-level standards can reflect the great variety of abilities, needs, learning rates, and achievement levels in any given classroom. The standards do not define the support materials that some students may need, nor the advanced materials that others may need access to. All students must have the opportunity to learn rigorous grade level standards if they are to access the knowledge and skills that will be necessary in their post-high-school lives. These standards define grade level expectations in all subjects for all students.

Standards vs. Curriculum

While the Idaho Department of Education reviews curricular materials as a service to local educational agencies (LEAs), no specific curriculum or strategies are required by the State of Idaho to be used to teach the Idaho Content Standards. LEAs make decisions about what resources will be used to teach the standards. LEAs can draw upon resources provided by the Department through the curricular materials review process to support their curricular review and selection process.

Organization of the Standards

These Idaho Content Standards for Artificial Intelligence are intentionally designed to serve students across grades 9 through 12, establishing a cohesive and progressive sequence for AI literacy. The standards are structured into primary domains that reflect the breadth of AI education, ranging from foundational fluency to critical impact analysis and technical aptitude. Each specific learning expectation is assigned a unique alphanumeric identifier to ensure clarity and easy navigation. The coding system follows a structured hierarchy ('GradeLevel.Domain.SubDomain.StandardNumber') which allows educators to quickly locate relevant content. For instance, the code '9-12.AIF.AU.1' systematically breaks down to identify the grade range (9-12), the primary domain (AI Fluency, or AIF), the specific sub-domain (Appropriate Use, or AU), and the individual standard number (1). This organization facilitates consistency across all subjects, helping educators align their instruction with state expectations.

Throughout this document, clarification statements are *highlighted in pink* and *examples are highlighted in blue.*

STANDARDS WORK GROUP

These standards reflect the collaborative efforts of a diverse committee comprising educators from across the state, post-secondary institution representatives, industry partners, parents, and local board representatives. The Idaho Department of Education extends its deepest gratitude to these dedicated committee members. Their invaluable time, thoughtful consideration, and rigorous dedication have ensured that these standards are both robust and relevant for Idaho's students.

Idaho 9-12 AI Standards Committee:

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AI FLUENCY

The AI Fluency standards are introductory standards recommended for 9th and 10th-grade students to develop the essential competencies required to navigate, utilize, and critically evaluate artificial intelligence in academic and professional settings. These standards emphasize the importance of discerning when to integrate AI tools versus traditional methods, while fostering an understanding of AI's cognitive impact, the mechanics of simulated environments, and the ability to interpret and communicate AI-generated outputs effectively. By bridging computing knowledge with personal and career goals, these standards aim to cultivate the critical thinking skills necessary for students to approach AI with a balanced perspective on its potential and its limitations.

Appropriate Use

Code	Standard
9-12.AIF.AU.1	Understand when AI versus non-AI solutions are appropriate. ***Clarification:*** *Appropriateness is context-dependent. The goal is for students to develop the critical thinking skills to evaluate this on a case-by-case basis.*
9-12.AIF.AU.2	Recognize that some AI can handle cognitive tasks, but reliance on AI might diminish individual human cognitive and emotional development. ***Example:*** *A student can use an AI tool to generate a report or do other schoolwork that is designed for student cognitive development. Moreover, some people use "AI Companions" for emotional support, which may affect recognition of human emotion in negative ways.*
9-12.AIF.AU.3	Explain the difference between physical and simulated environments.
9-12.AIF.AU.4	Understand that Large Language Models (LLM) are just one type of AI model and that others exist with different purposes. ***Example****: LLMs are trained on natural language text and generate text, whereas diffusion models are used for image generation, decision tree models can classify, linear regression models can predict numeric values, etc.*

College and Career Readiness

Code	Standard
9-12.AIF.CC.1	Interpret AI output and be able to communicate those to a diverse audience. ***Example**: Students are tasked with generating AI outputs for a specific assignment and then they share with the class the different solutions.*
9-12.AIF.CC.2	Connect AI knowledge and skills needed to achieve students' personal goals and career aspirations.

Evaluation and Critical Thinking

Code	Standard
9-12.AIF.ECT.1	Debate perspectives on differences between human and artificial intelligence and their implications for consciousness, creativity, ethics, and human responsibility.
9-12.AIF.ECT.2	Recognize and understand that AI systems are a technology that uses patterns in data to make decisions or generate new things. ***Example**: LLMs were trained on older writings that used the em dash consistently, hence why LLMs rely on the em dash so frequently.*
9-12.AIF.ECT.3	Analyze the potential biases and limitations of AI output. ***Example:** An example of a bias is, when asked about doctors, AI models generally assume doctors are all male. An example of one limitation is the fact that AI models can produce erroneous output (i.e., hallucinations).*
9-12.AIF.ECT.4	Analyze how choice of data sets used to train AI models can lead to potential bias in the output. ***Example**: A camera's face recognition tool only works on people with specific skin pigments due to input/training data.*
9-12.AIF.ECT.5	Recognize when an AI model produces erroneous outputs (i.e., hallucinations). ***Example**: An LLM creates a report that cites a document that doesn't actually exist.*
9-12.AIF.ECT.6	Give examples of how humans combine information from different bodily sensory inputs to make sense of the world, and compare that to how AI models learn about the world. ***Example**: LLMs largely learn from text written by humans, whereas humans use vision, olfactory, haptics, geolocation, etc., to ground their understanding of the world.*
9-12.AIF.ECT.7	Recognize and understand how AI agents can accomplish a defined task.

Application

Code	Standard
9-12.AIF.AP.1	Use an AI tool to critique student work. ***Example**: A student can use AI to ask for editorial feedback on a written assignment and make use of that to improve their writing.*
9-12.AIF.AP.2	Use AI tools to generate code for a simple coding project. ***Clarification:** Students run the code and evaluate the code's output but do not need to fully understand the code itself.*
9-12.AIF.AP.3	Construct AI agents to accomplish a defined task.

AI IMPACT

The AI Impact standards are higher level standards recommended for 11th and 12th-grade students to explore the broader consequences of artificial intelligence on learning, ethics, and society. These standards guide students in analyzing the distinctions between human and AI problem-solving, debating regulatory frameworks, and evaluating the ethical considerations of data collection and AI application. By examining how AI influences diverse fields such as writing, art, and cybersecurity, these standards equip students to assess the risks, benefits, and long-term societal impacts of emerging technologies, fostering responsible and informed decision-making.

Ethics and Privacy

Code	Standard
9-12.AII.EP.1	Evaluate the ethical implications of how AI has changed since GenAI has become commonplace ***Example**: Each content area can focus on how GenAI has impacted and changed aspects within their field (like writing, music, art, social media, math, etc).*
9-12.AII.EP.2	Analyze how AI tools shape user experiences for people with diverse backgrounds and characteristics. ***Example**: Real-time translation tools and AI-driven accessibility features (like speech-to-text for the hearing impaired or image-to-text descriptions for the visually impaired) remove barriers for non-native speakers and people with disabilities.*
9-12.AII.EP.3	Explore the societal, environmental, and ethical implications of large-scale data collection and processing and how this relates to AI applications.
9-12.AII.EP.4	Assess how unauthorized data collection has influenced the practice of training AI models. ***Example**: An AI model is trained on art without the artist's permission which can lead to legal implications and can change the training process.*
9-12.AII. EP.5	Analyze the benefits, risks, and ethical implications of AI in cybersecurity.

Impact on Society

Code	Standard
9-12.AII.IS.1	Evaluate AI-generated output to assess bias, accuracy, and potential harms.
9-12.AII.IS.2	Analyze how workers in different careers use AI to solve problems.

Code	Standard
9-12.AII.IS.3	Analyze how decisions made at different stages of working with data can lead to biased data, misleading conclusions, and compromised AI models. ***Example**: In a statistics or math course, students can take a collection of data and submit into an AI system then compare the differences.*
9-12.AII.IS.4	Debate perspectives on differences between human and artificial intelligence and their implications for consciousness, creativity, ethics, and human responsibility.
9-12.AII.IS.5	Evaluate how human choices in using, designing, deploying, and regulating AI technologies have risks, benefits, and long-term impacts.

AI Technical Aptitude

The technical aptitude standards are recommended for 9th to 12th-grade students who want a deeper understanding of technical aspects of AI including, but not limited to, computer science or other engineering students. Technical aptitude refers not to the using of AI, but rather to the 'building' of AI models. Building an AI model includes an understanding of data collection, preparation, analysis, and machine learning principles. Beyond technical abilities, an understanding of model development workflow is important, including how data affects which model to choose, how model choice affects results, and how to interpret results. Finally, it is important to understand the broader context of how machine learning and AI affect individuals and societies.

Data and Analysis

Code	Standard
9-12.AITA.DA.1	Use a digital tool to clean and organize text-based data. ***Example:*** *Students can split text into words, sort by frequency or collate, normalize spelling, remove punctuation, and make everything lowercase.*
9-12.AITA.DA.2	Evaluate different approaches to verifying consistency and compliance with expected data types, values, and ranges. ***Example:*** *While preparing a data source for use, a column of numerical data has a row with a word/string.*
9-12.AITA.DA.3	Examine the procedure of how data is used to train machine learning models. *Clarification: The lifecycle of collecting and munging data, identifying features, and creating train/dev/test data splits.*
9-12.AITA.DA.4	Apply data acquisition, cleaning, and transformation techniques to prepare data for AI analysis. ***Example:*** *Use something like NotebookLM to scrape a website, then pull specific data out of the result for analysis.*

Code	Standard
9-12.AITA.DA.5	Investigate ways to improve the accuracy of a machine learning model and reduce bias by refining the quality of examples and nonexamples in the training data. ***Clarification:*** *Students don't actually need to train a classifier, rather they can look at datasets and determine what might need to be done to improve the model, by augmenting the data.* ***Example:*** *A speech recognizer only recognizes adult, male, standard American English speakers because it was trained on news transcripts from the 1960s. Augmenting with women and children and with more varied accents would make the recognizer more robust.*
9-12.AITA.DA.6	Justify the selection of a type of machine learning model to accomplish a task. ***Example****: The XOR problem is best solved by rule-based logic (and is not solvable with a linear classifier), but ambiguous problems like question-answering using text are better solved with data on more complex models like LLMs.*
9-12.AITA.DA.7	Evaluate training data by examining its source, quality, representativeness, potential biases, and privacy implications. ***Example:*** *Pick a dataset commonly used to train a model like ImageNet and critique it on the listed criteria.*

AI Methods

Code	Standard
9-12.AITA.AIM.1	Create an application using pre-existing supervised learning models to make predictions or classifications.
9-12.AITA.AIM.2	Integrate a prebuilt AI agent into an application.
9-12.AITA.AIM.3	Discuss how a machine learning model generates classifications or predictions. ***Clarification:*** *Machine learning is different from classical programming in that data is used to 'write' functions that take inputs and return outputs.*

Code	Standard
9-12.AITA.AIM.4	Justify whether a problem is best solved using procedural instructions, rule-based logic, data-driven methods, or a combination of these approaches. ***Example:*** *Logistic regression for a binary task on an edge device, a decision tree for 20 questions, and a neural network for image classification.*
9-12.AITA.AIM.5	Understand the differences between common machine learning models. ***Example:*** *Common models include logistic regression, decision trees, and neural networks.*
9-12.AITA.AIM.6	Evaluate the features and limitations of a machine learning model. ***Example:*** *A decision tree can show feature importance, but it is limited in how it works. Logistic regression, likewise, is a linear classifier that cannot solve the XOR problem.*
9-12.AITA.AIM.7	Plan safeguards for AI systems that protect human well-being and privacy while ensuring meaningful human involvement in decision-making. ***Example:*** *Web search can return anything, or you can filter it for child-appropriate content.*
9-12.AITA.AIM.8	Examine the procedure of how data is used to train machine learning models. ***Example:*** *Looking at the complete data lifecycle including collecting, data munging, feature engineering, and creating training, development/validation, and test data splits.*
9-12.AITA.AIM.9	Interpret AI results using common metrics and be able to communicate those to a diverse audience. ***Example:*** *A credit card fraud classifier is 99.9% correct using an accuracy metric, but that's only because 99.9% of transactions are not fraudulent.*

GLOSSARY

This glossary is not comprehensive, nor are all the terms used in the standards. They are included for reference.

Agentic AI: AI systems designed to independently plan, execute, and adjust actions to achieve a specific goal with minimal human intervention, often capable of working across multiple tools or applications.

AI Companion: A highly personalized, conversational AI designed to simulate human-like relationships, offering emotional support, companionship, and customized personalities rather than just executing practical tasks.

AI Literacy: AI Literacy represents technical knowledge, durable skills and future-ready attitudes required to thrive in a world influenced by AI. It enables learners to engage, create, manage, and design AI, while critically evaluating its benefits, risks, and ethical implications.

Anthropomorphism: The cognitive tendency to attribute human traits, emotions, intentions, or consciousness to AI systems, which can lead to unrealistic expectations, misplaced trust, or the mistaken belief that an AI platform is capable of genuine social connection or personal experience.

Artificial Intelligence (AI): A branch of computer science focused on building systems capable of performing tasks that typically require human intelligence. AI leverages massive data sets and computational power to make predictions, increasingly impacting various aspects of our daily lives.

Automation: The use of technology to perform tasks, processes, or workflows with minimal human assistance to increase efficiency, speed, or precision.

Generative AI (Gen AI): GenAI is a subset of machine learning and AI specifically designed to create new content, including text, images, audio, code, video, or synthetic data based off a prompt.

Hallucination: Instances where an artificial intelligence system generates information that is incorrect, misleading, or entirely fabricated, but presents it as if it were true.

Human-Centered: An approach where AI is used specifically to support human inquiry. It ensures that humans remain responsible for the initial objective, final decision-making, oversight, and ethical reflection at the beginning and end of every task (Human→AI→Human).

Human-in-the-loop: A model of interaction where a human is required to participate in a process, such as verifying, approving, or correcting, to ensure the accuracy, safety, and ethical alignment of AI-generated outcomes.

Large Language Model (LLM): A specific type of Generative AI trained on vast amounts of text data to recognize, predict, and generate human-like text responses.

Machine Learning: A subfield of AI where computer systems are trained to identify patterns in large datasets, allowing them to improve their performance on tasks over time without being explicitly programmed for every step.

Personally Identifiable Information (PII): Information that can be used to identify a specific person, such as a name, home address, phone number, email address, or student ID number.

Predictive AI: AI models that analyze historical and existing data to make forecasts or estimations about future events, trends, or outcomes.

Simulated Environment: An artificial, controlled setting created to replicate real-world conditions. Examples range from computer games and AI-generated videos, to two humans role-playing a situation like a job interview.

Synthetic media: Content, such as images, audio, video, or text, that has been created, modified, or generated by AI, often used to simulate reality.