

# AI, EDUCATION, AND ETHICS FOR A CHANGING WORLD

Join the webinar on AI's place in education, including the opportunities, challenges, and concerns.

August 20, 3:00-4:00 PM ET



**Joan Haley**  
Shelburne  
Farms



**Jake Baskin**  
Computer  
Science Teachers  
Association



**Edwin Goutier**  
LaunchPath

# Our speakers will highlight:

- **AI-powered tools for environmental education**, to protect our land, air, and water, and build healthier communities
- **Empowering Students as AI Navigators** to help create student ownership in how they understand and use AI in their lives—and the essential role educators play in guiding this journey
- **AI's Environmental Footprint** and how organizations are working to reduce its impact
- **Educator-specific resources** and key features of leading AI tools
- A proposed **ethical framework** for when and how to integrate AI in meaningful, learner-centered ways





# How much do you know about AI?

1. I'm an expert! ☺
2. I know just enough  
to be dangerous!
3. Pretty much  
nothing!

Thanks for sending in your questions!  
We'll get to as many as we can!



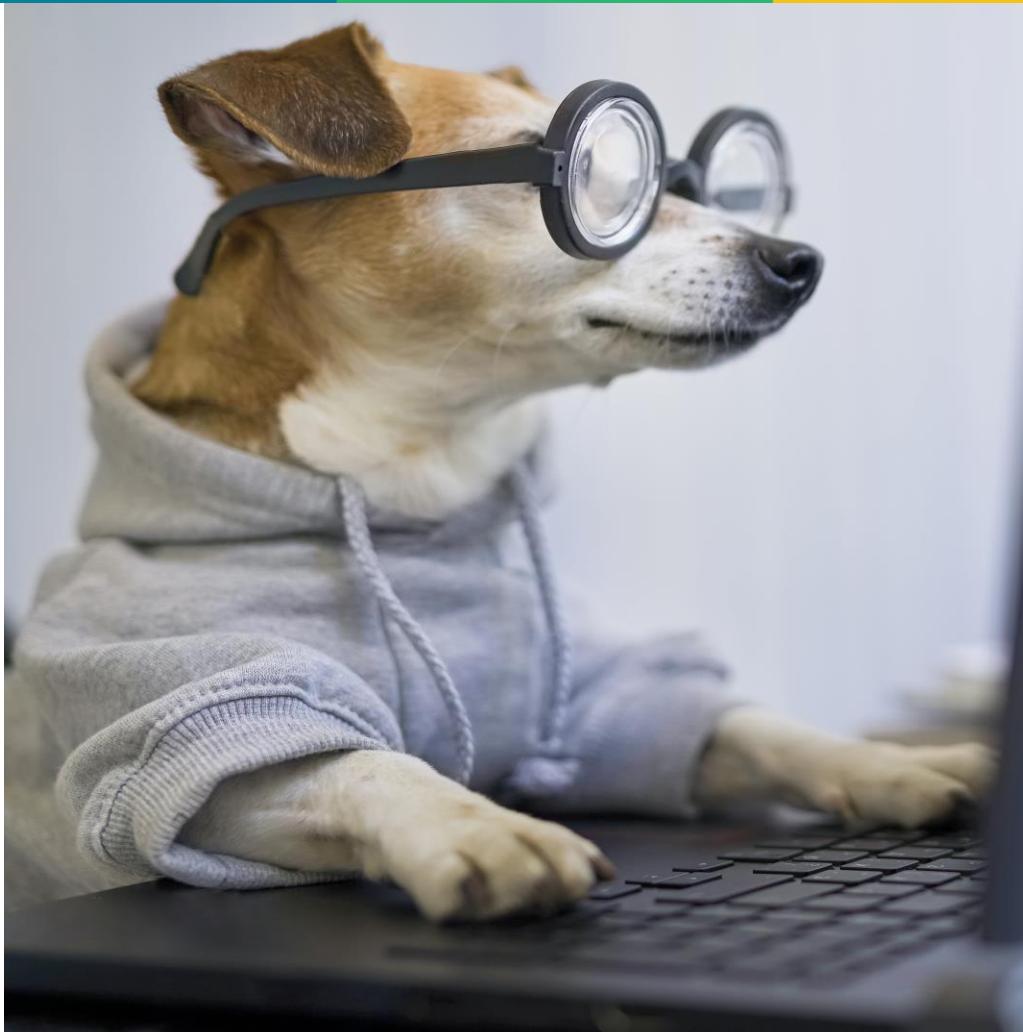
**NAAEE's Webinar Series:  
Bringing New Ideas and  
Insights to the Our Field  
and Beyond!**



# Thanks to our Affiliate Co-hosts!



North American Association  
for Environmental Education



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conversation &  
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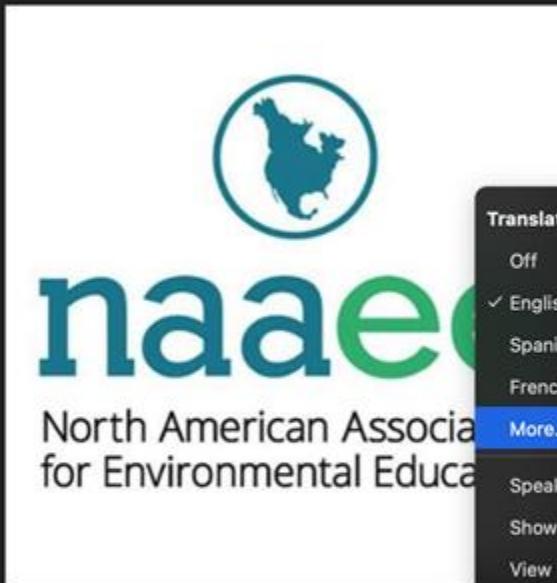
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- Automate translated captions
- Select your preferred language (31 options!)



# Thanks, Carrie!



**Carrie Albright,**  
Senior Communications and Data Specialist

A photograph of three dolphins swimming in clear blue water over a vibrant coral reef. The dolphins are facing the camera, with their heads above the water. In the background, a scuba diver is visible, providing a sense of scale to the marine life. The water is a deep, translucent blue, and the coral reef below is a mix of orange, red, and brown hues.

# Introducing Our Speakers!

# 3 Great Presenters!



**Edwin Goutier**

*CEO  
LaunchPath*



**Jake Baskin**

*CEO  
Computer Science  
Teachers Association*



**Joan Haley**

Co-founder of Education for Climate Resilience and the co-creator of Greentime.ai.



## Edwin Goutier

*CEO*

*LaunchPath*

- **Co-Founder & CEO of LaunchPath**
- **Social innovation leader and business strategy enthusiast.**
- **Works at the intersection of innovation, technology, and equitable access to opportunity**
- **Member of the NAAEE Board of Directors**
- **Strategic Advisor, Innovation, Gamut Purpose Partners**
- **Vice President of Innovation at United Way (His work was featured in Fast Company and more!)**
- **Creator & Chief Curator, #xforx playlists**



## Jake Baskin

*CEO  
Computer Science Teachers  
Association*

- **Executive director of the Computer Science Teachers Association**, the world's leading association for K–12 computer science teachers.
- Led a **complete turnaround of CSTA** from the brink of insolvency to a thriving professional development and community-building association of over 20,000 members and 100 chapters worldwide.
- The organization has launched professional learning programs reaching over **5,000 participants annually**, secured over \$20 million in new funding commitments, and grown from a staff of two to a team of twenty.
- He is a **former high school computer science teacher, department chair, and professional development provider with Chicago Public Schools**. As a teacher, he focused on increasing access to computing for underrepresented groups, and he more than doubled female enrollment in introductory computer science classes.
- He was **director of state government affairs for Code.org**, where he worked with educators and policymakers to advocate for policies that expand access to high-quality computer science education with state departments of education and governors' offices across the country.



## Joan Haley

Co-founder of Education for Climate Resilience and the co-creator of Greentime.ai.

- More than **30 years of experience** designing environmental education programs for schools, parks, and communities
- Co-founded **Education for Climate Resilience** to help educators reconnect students with their local environments and communities.
- Her work is grounded in the **belief that meaningful, place-based actions can build collective power** for a more sustainable and just future.
- She co-created **Greentime.ai** with a remarkable team of experienced and dedicated colleagues. This initiative **helps educators use AI thoughtfully** to reduce their administrative load while amplifying student-driven learning and intergenerational climate action.
- Has expertise in **curriculum design, educator professional development, and climate partnerships**, and has led innovative international and national programs for the **National Park Service, Shelburne Farms, the North American Association for Environmental Education, the Smithsonian Institution, the Environmental Protection Agency, and the U.S. Peace Corps.**
- Holds a **doctorate in education**, a master's in environmental science, and a master's in public administration.



Over to you,  
Edwin!



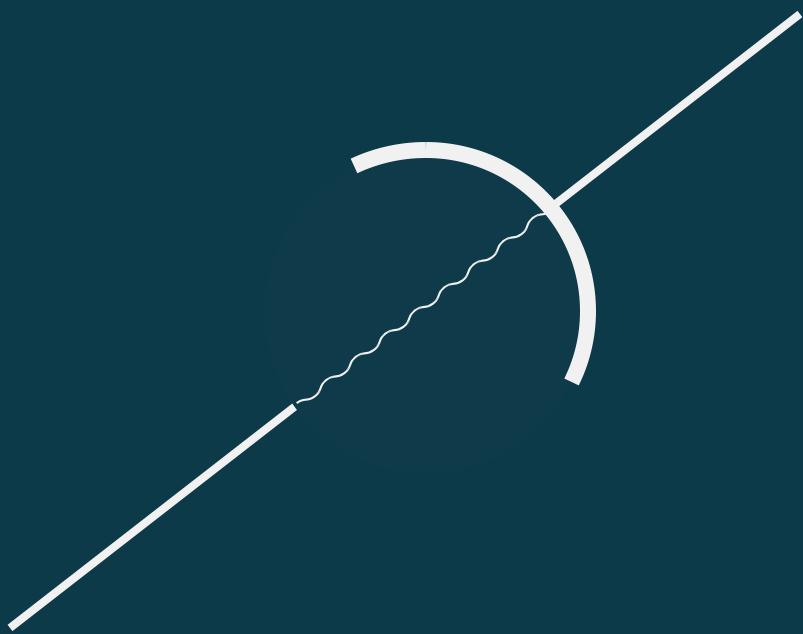


# Gen AI Opportunities for Environmental Educators

*United Way of North Central Florida Staff Retreat*



# What is Generative AI?



# Common Gen AI Content

**Text**

**Images**

**Video**

**Audio**

## Common Tools

**ChatGPT | Claude | Gemini**

## Emerging Tools

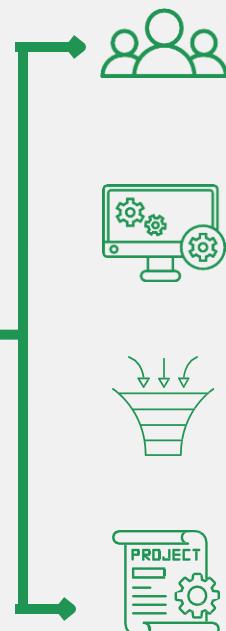
**Perplexity  
Google Notebook  
Zapier MCP**

Reimagine your job as different types of “content”. Break down your last activity into what types of content you produced.

Use that approach to think through how AI can assist you in making something new.



## 4 Examples for EE Professionals



**Personalized mass voicemail  
messages**

**Chat with a dataset**

**Create an on-demand course**

**Develop an app for young learners**

How might AI help  
your team innovate?





Ideate



Validate

# Launch



# Risks and Responsibilities

**Bias**

**Halucination/Accuracy**

**Sensitive Data**

**Human in the Loop**

**Choose the right uses**

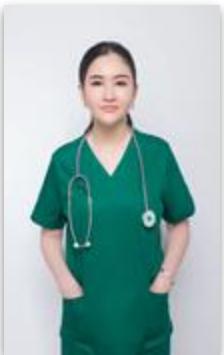
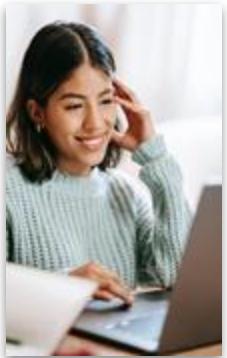
**Policies and Procedures**

[csteachers.org/ai-priorities](https://csteachers.org/ai-priorities)

# AI Learning Priorities for All K-12 Students



# Introducing the Personas



# Introducing the Personas



## Bishakha Meremikwu

Medical School Student



### CURRENT JOB

Bishakha is a third-year medical student.

### LOCATION

Chicago, IL

### EDUCATION

- B.A. in Physics
- Graduated from Wausau High School (urban school, graduating class of 832 students)

### ASPIRATIONS

She has not yet decided on a medical speciality; she is considering family medicine, but she is also contemplating medical research.

Bishakha has observed that the treatment plans presented to her family and friends when they receive medical care differ greatly from the guidelines that she is learning in her coursework. She wonders how much of this is driven by software that recommends treatment, by insurance companies trying to cut costs, by the fact that most of her family and friends are Black, or by some combination of these factors.

### BACKGROUND

Bishakha was born in Lagos, Nigeria, and moved to Milwaukee, Wisconsin, with her parents, who are both doctors, when she was in the sixth grade.

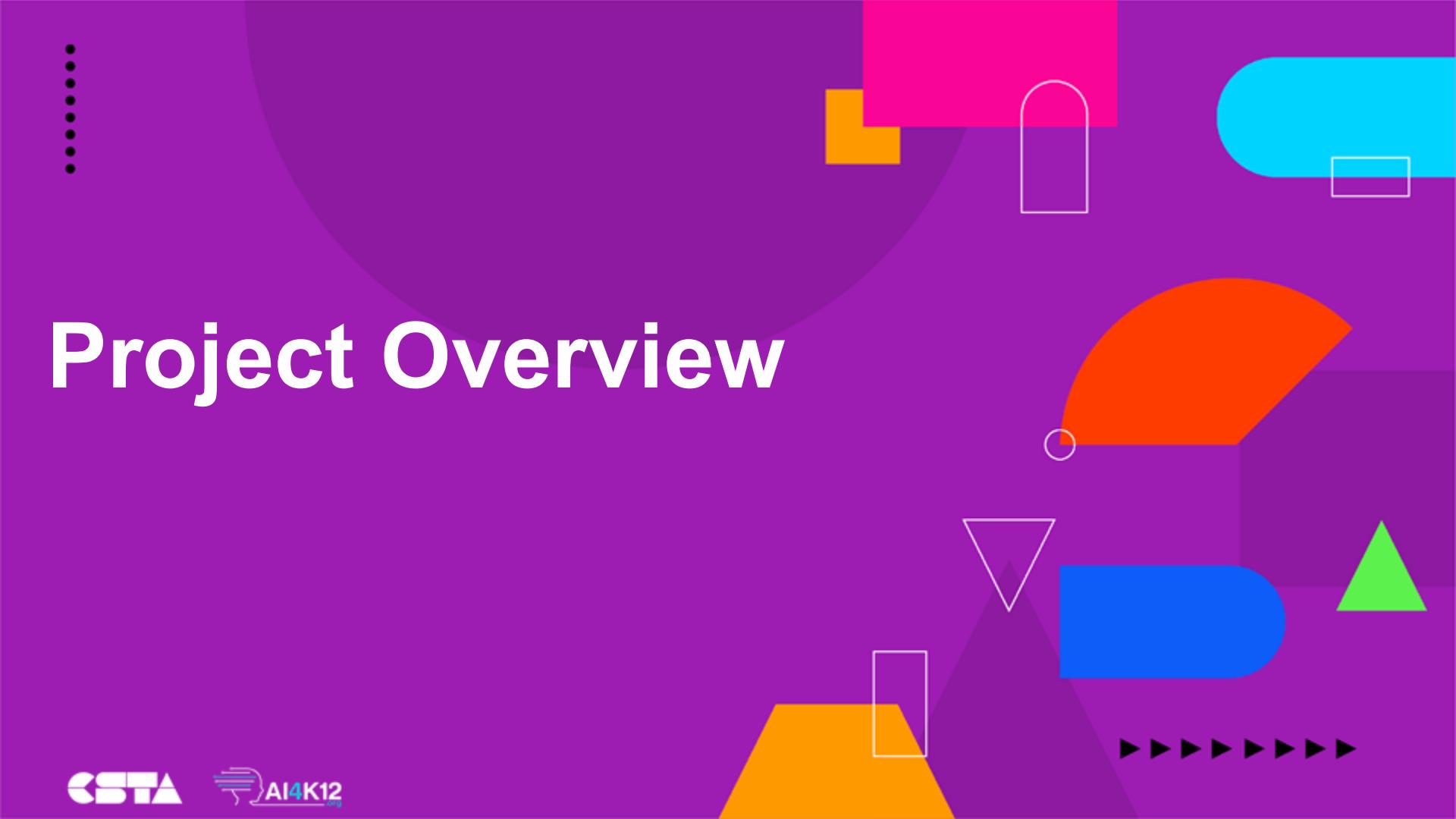
### PERSONAL

While she does not have much free time, she enjoys yoga and watching cooking shows.

# Pick a Persona

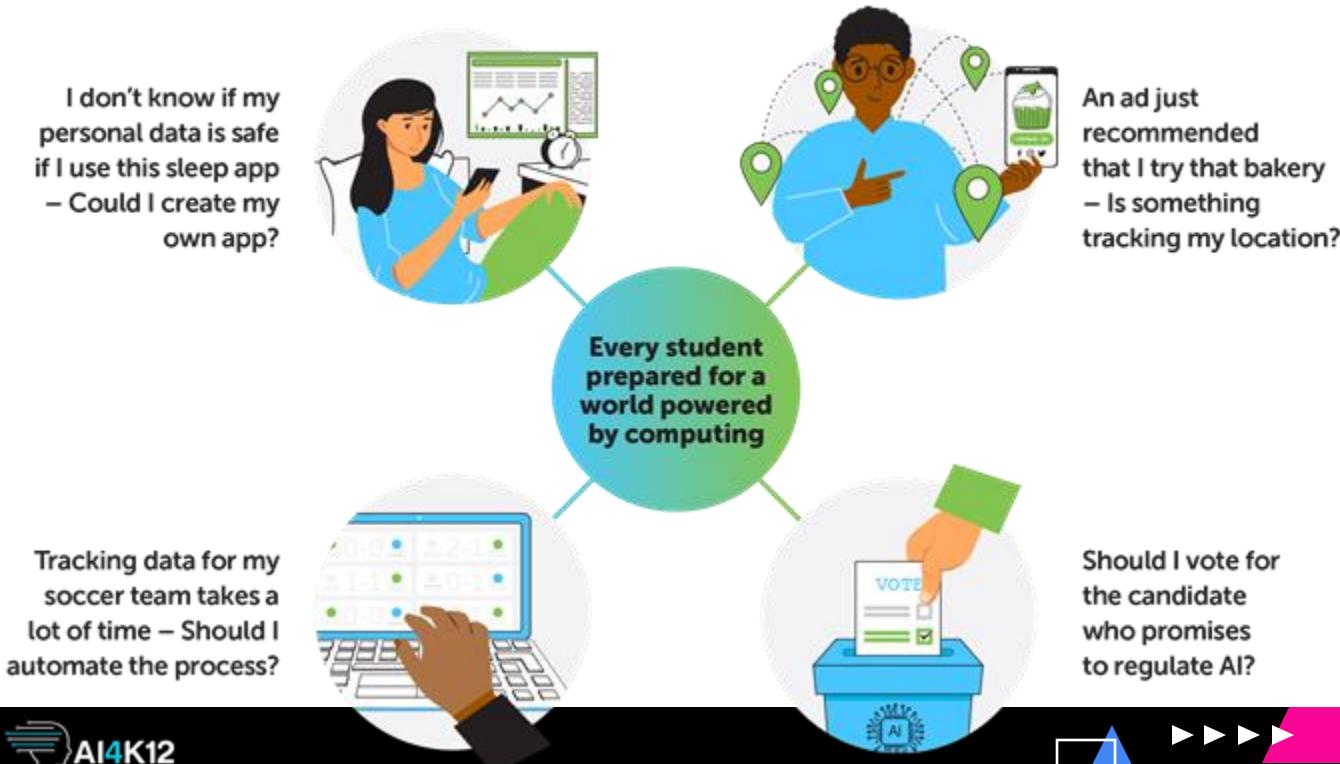
1. Go to: [ReimaginingCS.org/personas-for-reimagining-cs](http://ReimaginingCS.org/personas-for-reimagining-cs)
2. Pick a persona (they start on page 3)
3. Spend 3 minutes thinking about *what CS and AI knowledge and skills are most important for your persona?*
4. WAIT :)
5. When I say go, enter your skills into the chat

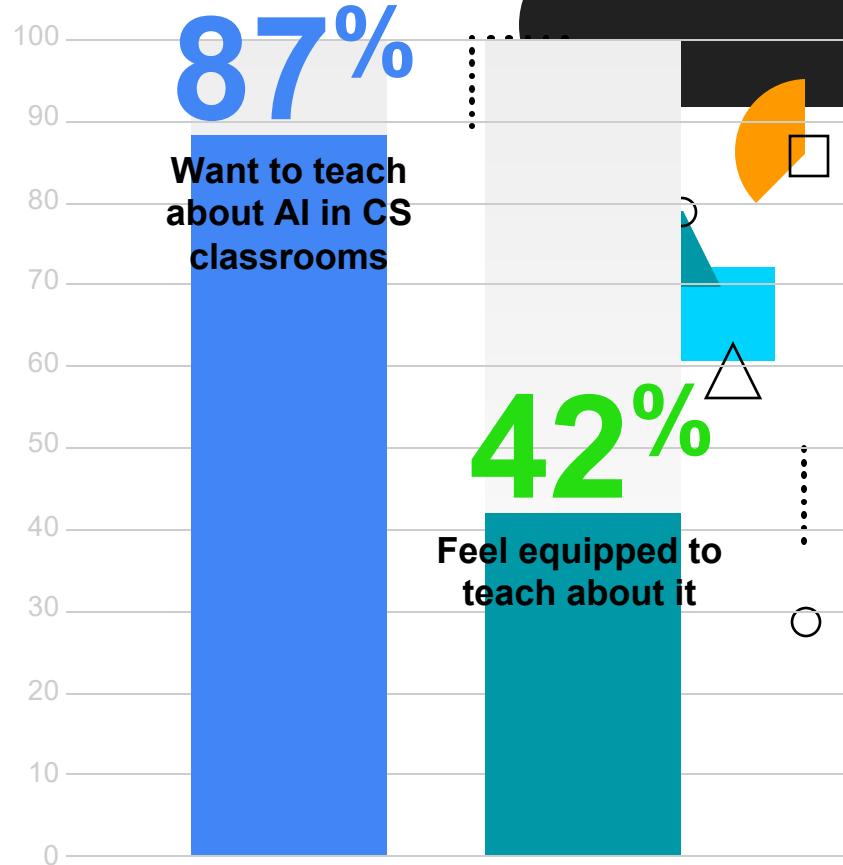
# What CS and AI knowledge and skills are most important across personas?



# Project Overview

# Every Student Prepared for a World Powered by Computing





# Goals

# The Need to Prioritize

What is **essential** for all students?

- What will develop a well-informed citizenry?
- What enables “all students [to be] prepared for a world powered by computing”?

# The Need to Prioritize

I know students are able to learn this at this age.

Just because it's possible (or fun) doesn't mean it's **essential**.

But it's important!

Lots of things are important. Is it **essential** for all students, regardless of career path?

Students need this for CS careers.

# As a result of learning essential AI content, students should be able to:

**1**

Understand how AI technologies work and recognize where AI might be used

**2**

Use and critically evaluate AI systems, including their societal impacts and ethical considerations

**3**

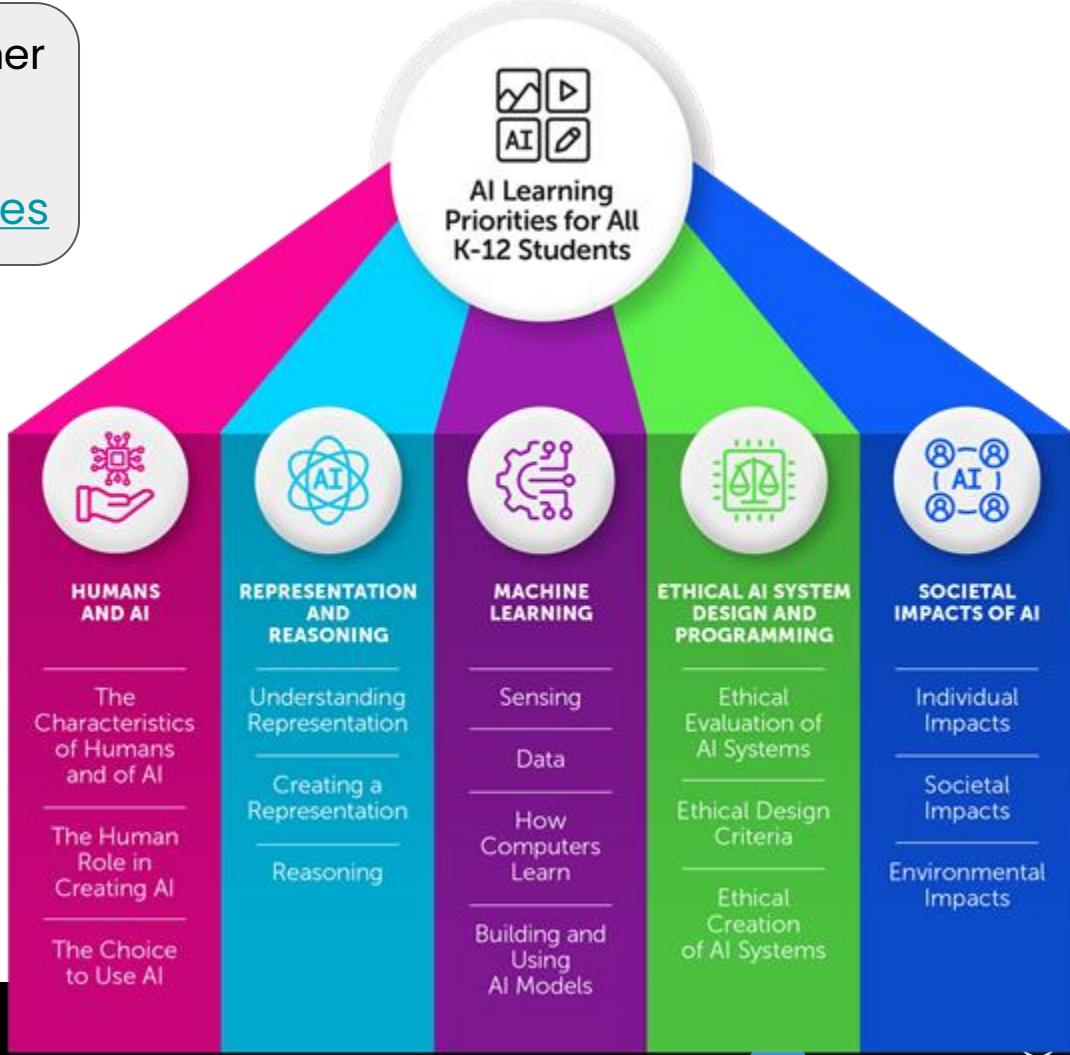
Create – and not just consume – AI technologies responsibly

**4**

Be innovative and persistent in solving problems with AI

Find the full report and other resources at:

[csteachers.org/ai-priorities](https://csteachers.org/ai-priorities)





# AI Priorities for All K-12 Students

# Humans and AI

Subtopic	Grades K-2	Grades 3-5	Grades 6-8	Grades 9-12
<b>The Nature of Humans and of AI</b>	Compare and contrast the nature of humans versus the nature of AI (e.g., living versus nonliving).	Compare and contrast the ability of humans and of AI to perform various tasks and serve in various roles (e.g., create art, recognize emotions, be a friend, serve as a tutor).	Identify the assumptions inherent in the operation and output of an AI model and how these assumptions might have different implications for different people.	Debate what differences do or should exist between human and artificial intelligence, sentience, consciousness, rights, and responsibilities.
<b>The Human Role in Creating AI</b> 	Understand that AI is a tool created by humans to make decisions or to generate something (e.g., an image).	Describe the role of humans in the creation of AI.	Describe the roles that humans play (including in data curation and labeling) in creating and refining AI models.	Evaluate and analyze the roles of humans and human decision-making in the creation of AI.
<b>The Choice to Use AI</b>	N/A	Evaluate when AI is or is not a helpful resource to carry out a task.	Debate when humans should or should not use AI to perform a specific task.	Analyze the risks, benefits, and effectiveness of using AI for specific tasks (e.g., coding, brainstorming), including when AI is used to fully automate a process or is used with a human-in-the-loop approach.



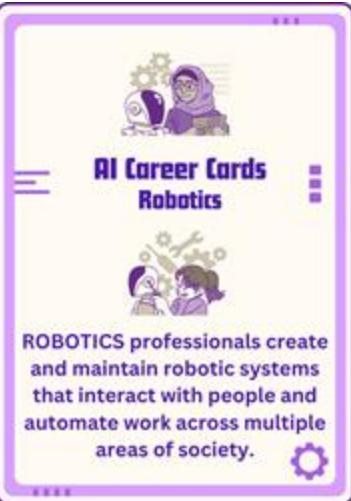
# Career Cards

## 15+ AI or AI-related Careers



**AI Career Cards Core AI**

CORE AI professionals create AI functionality for AI products, services, and tools we use in our personal and professional lives.



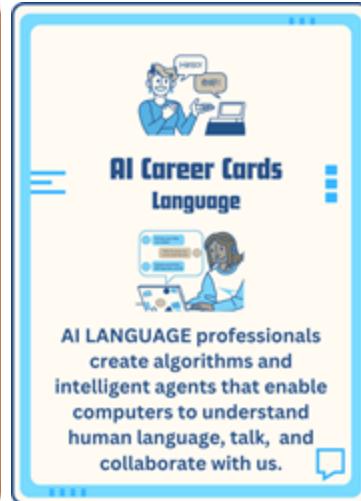
**AI Career Cards Robotics**

ROBOTICS professionals create and maintain robotic systems that interact with people and automate work across multiple areas of society.



**AI Career Cards Data**

DATA professionals collect, organize, store, and process large data sets that are used to train AI models and gain insights.



**AI Career Cards Language**

AI LANGUAGE professionals create algorithms and intelligent agents that enable computers to understand human language, talk, and collaborate with us.



**AI Career Cards Product Design**

AI PRODUCT DESIGN professionals design, program, and launch innovative AI products through understanding the needs of users and goals of businesses.

View, Download, and Find Resources: <https://ai4ga.org/careers/>



# Career Cards

## 15+ AI or AI-related Careers

**COMPUTER VISION  
ENGINEER**



**10**

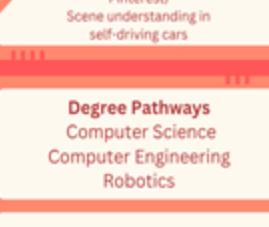
Develops algorithms and applications that allow computers to recognize information in images or videos

**Examples**  
Face recognition in smart phones  
Visual search (e.g., Google Lens, Pinterest)  
Scene understanding in self-driving cars

**Degree Pathways**  
Computer Science  
Computer Engineering  
Robotics

**Technical Skills**  
Computer Vision Image Processing  
Machine Learning Artificial Intelligence  
Programming Computer Graphics

**Median Salary**  
\$165,000 - \$170,000



**11**

Examples  
Face recognition in smart phones  
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**Degree Pathways**  
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**Technical Skills**  
Computer Vision Image Processing  
Machine Learning Artificial Intelligence  
Programming Computer Graphics

**Median Salary**  
\$165,000 - \$170,000

**DATA ARCHITECT**



**09**

Designs and implements an organization's strategies for data storage and access

**Examples**  
Designing an Internet retailer's product and customer databases  
Implementation of storage and security policies for public records databases

**Degree Pathways**  
Information Systems & Technology  
Computer Science  
Data Science

**Technical Skills**  
Software Development Machine Learning  
Databases Data Visualization  
Cloud Computing Cybersecurity



**10**

Designs and implements an organization's strategies for data storage and access

**Examples**  
Designing an Internet retailer's product and customer databases  
Implementation of storage and security policies for public records databases

**Degree Pathways**  
Information Systems & Technology  
Computer Science  
Data Science

**Technical Skills**  
Software Development Machine Learning  
Databases Data Visualization  
Cloud Computing Cybersecurity

**Median Salary**  
\$143,000 - \$150,000

View, Download, and Find Resources: <https://ai4ga.org/careers/>

# Representation and Reasoning

Subtopic	Grades K-2	Grades 3-5	Grades 6-8	Grades 9-12
<b>Understanding Representation</b>	N/A	Understand how a representation is an abstraction that focuses on some features and leaves others out.	Understand that representation includes modalities (text, speech, audio, image, video) and symbolic mappings (text, graphs).	Describe how current AI models (e.g., LLMs) use data representation.
<b>Creating a Representation</b>	Create a representation of a physical object (e.g., line art drawing).	Create an abstract representation of a physical system that can be used to solve a problem (e.g., a map).	Create and evaluate different abstract representations (e.g., subway map).	Choose and use an appropriate representation of complex data for processing by an AI algorithm.
<b>Reasoning</b>	Explain how binary choices (e.g., up/down, on/off, under/over) can be used to make decisions that lead to a specific goal by either a human or a machine.	Train a model that can make decisions based on defined criteria (e.g., a dichotomous key to determine which movie to see).	Identify the kinds of AI models (e.g., classifier, predictor, recommender) people interact with in their daily lives.	Describe different types of AI algorithms and models, and compare and contrast the strengths and limitations of their reasoning.

# Kinds of decisions computers can make

- Classification
- Prediction
- Recommendation
- Planning and scheduling

An algorithm that performs one of these decision-making tasks is called a **reasoner**.

There can be multiple **reasoning algorithms** for the same task. For example, there are many classification algorithms, i.e., many types of reasoners that do classification.



# Living and Working with Artificial Intelligence

## Module 3.1

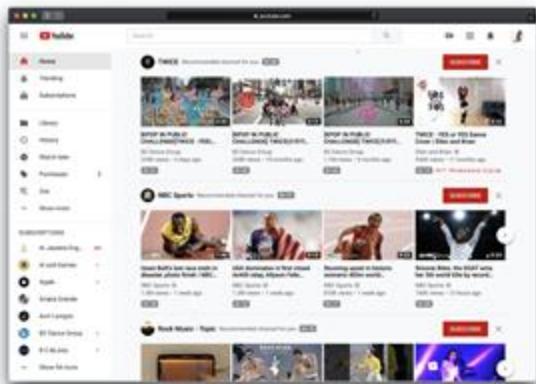
### How do computers make decisions?

Artificial Intelligence  
For Georgia

#### *Student Activity*

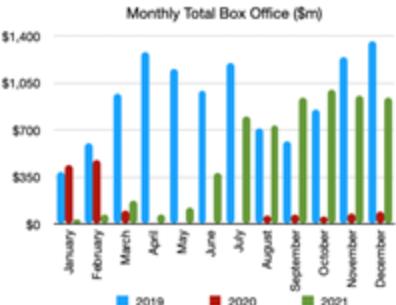
## Name the Reasoner

*Guess which kind of reasoner is used for each of 15 images*



#### 2021 Domestic Theatrical Market Prediction

Total Domestic Box Office:	<b>\$6.3bn</b>
Wide Releases:	<b>91</b>
Top grossing movies:	
Sing 2	Dec 22 \$250m
Shang Chi ... Ten Rings	Sep 3 \$230m
Eternals	Nov 5 \$230m
Spider-Man: No Way	Dec 17 \$230m
The Suicide Squad	Aug 6 \$210m
No Time to Die	Oct 8 \$180m
The Matrix 4	Dec 22 \$180m



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Please email us at [research@the-numbers.com](mailto:research@the-numbers.com) for information on this and other custom reports.



# Machine Learning

Subtopic	Grades K-2	Grades 3-5	Grades 6-8	Grades 9-12
<b>Sensing</b>	Compare and contrast human sensing with computer sensors.	Describe various ways that a human might interact with an AI system (e.g., through voice, text, or gestures).	Use sensors to collect data, and then train an AI model using the sensor data.	Using sensor data (e.g., from autonomous vehicles), train an AI model.
<b>Data</b>	Explore how AI models learn from data.	Explore the relationship between the properties of training data (e.g., size, features, biases) and an AI model's output.	Describe the ways that bias can be introduced and mitigated in an AI model.	Evaluate the data used to solve a problem, including its source(s) and whether privacy is protected, if/how the data has been processed, data quality (e.g., accuracy, reliability, validity), what the data represents, and biases.
<b>How Computers Learn</b>	Understand how computers learn from data and patterns.	Investigate how AI models learn by using data (including why examples and non-examples are required in training sets) and algorithms to find patterns and generate output.	Create and evaluate an appropriate AI algorithm (e.g., a decision tree classifier) to accomplish a task.	Select and use an appropriate AI algorithm for a classification task (e.g., KNN, decision tree).
<b>Building and Using AI Models</b>	Use data to construct a model for making decisions (e.g., a decision tree to determine what to wear based on the weather).	Using a dataset, develop an AI model to classify inputs.	Using a dataset and a machine learning pipeline, develop an AI model, and consider the impact of the model on various users.	Using a dataset and a systematic process, develop an AI model to generate for classification or prediction, and articulate the assumptions made at each of these steps: (1) develop a question solvable with AI, (2) collect or curate data, (3) evaluate the data, (4) train an AI model on the data, (5), evaluate the model, and (6) iteratively improve the model.

# Machine Learning (ML)

How computers recognize patterns and make decisions without being explicitly programmed.



## Supervised Learning

*Goal: Learn the relationship between inputs and outputs so it can accurately predict the output for new, unseen data*

### Labeled Data

*input - output pairs*

### Usage:

Classification & Prediction

## Unsupervised Learning

*Goal: Discover hidden patterns, structure, or relationships within data.*

### Unlabeled Data

No predefined outputs to learn from

### Usage:

Clustering (Customer Segmentation)

## Reinforcement Learning

### Trial & Error Learning

Unlabeled Data

Usage: Game playing, robotics, and control systems

# Ethical AI Systems Design and Programming



Subtopic	Grades K-2	Grades 3-5	Grades 6-8	Grades 9-12
<b>Ethical Design Criteria</b>	N/A	Investigate an example of AI decision making, considering if it is fair – as well as what it means to be fair.	Explore strategies to turn ethical considerations into actions, such as mitigating bias in datasets.	Evaluate an AI model (e.g., using a model card) to determine the model's features as well as its biases, explainability, fairness, privacy, accuracy, and transparency.
<b>Ethical Evaluation of AI Systems</b>	Explore how an AI system can help and harm different groups at the same time.	Investigate examples of AI, considering differences in experience by different people in different contexts.	Describe the properties, biases, and assumptions of various kinds of AI models (e.g., classifier, predictor, recommender).	Evaluate the design, motivation, outcomes, and potential impacts of AI systems using ethical design criteria and/or ethical frameworks.
<b>Ethical Creation of AI Systems</b>	N/A	Describe an AI design process that considers the impact on end users and others who are impacted by the AI system.	Create a program using available AI tools, AI plugins, APIs, and/or AI models, with the following ethical considerations for the model's end users as well as others who are impacted by the model: fairness, bias, and accuracy, and then create a model card.	Train, iteratively improve, and then develop a model card for an AI model with the following ethical considerations for the model's end users as well as others who are impacted by the model: fairness, bias, safety, security, intellectual property, privacy, robustness, explainability, accuracy, transparency, and accountability.

# Societal Impacts of AI

Subtopic	Grades K-2	Grades 3-5	Grades 6-8	Grades 9-12
<b>Individual Impacts</b>	Identify where AI is being used in daily life.	Explore how one's actions may result in the collection of data.	Explore the tradeoffs related to human agency (including privacy, safety, creativity, autonomy, and intellectual property) when AI is used.	Evaluate how AI use impacts an individual's decision making and other behavior.
<b>Societal Impacts</b>	Explore how some people use AI in their jobs and in their communities.	Explore ways in which some jobs involve the creation and/or use of AI.	Identify the intended and unintended impacts of AI on society – including government, education, entertainment, culture, careers, and national security – while considering how these impacts may differ among diverse communities.	Evaluate the intended and unintended impacts of AI on society (e.g., deep fakes, job loss) – including government, education, entertainment, culture, careers, and national security – while considering how these impacts may differ among diverse communities.
<b>Environmental Impacts</b>	N/A	Explore the impact of AI on the environment.	Investigate the positive and negative environmental impacts of AI (e.g., minimizing deforestation via application of AI, energy use by AI).	Design ways to minimize negative environmental impacts of AI and communicate those ways to others.

# Topics and Concepts in Ethics and Social Impacts of Computing

Nature of harm  
linked to computational  
technologies

Mechanisms of harm  
linked to computational  
technologies

Design values  
for computational technologies

What kinds of harm can  
computational  
technologies have on  
our world?

e.g., racial discrimination  
in hiring practices → lack of professional  
and economic opportunity

How do they cause  
those harms?

e.g., algorithmic bias,  
data bias, inappropriate automation of  
decision-making systems

What values should  
they be designed  
towards to prevent  
those harms?

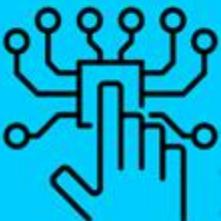
e.g., fairness, accuracy, justice

# Promising Practices for Teaching K-12 AI

Based on these presentations, we offer the following recommendations for AI curriculum:

## BEGIN IN EARLY ELEMENTARY SCHOOL

While studying some aspects of AI requires advanced mathematics, many aspects do not. Even the youngest elementary school students can learn – ideally from engaging, hands-on experiences – that, for example, a decision tree can be used to show the process by which decisions are made. This type of learning creates a foundation that permits older students to study more advanced topics.



## USE SUPPORTIVE TOOLS

We note that more tools need to be developed to support AI education. However, extant tools can help make complex topics accessible to students, and they can also provide interactive learning experiences that do not require programming to implement. For example, middle school students can train classifiers using Google's [Teachable Machine](#) and [MIT RAISE Playground](#), and high school students can experiment with neural networks using [Neuron Sandbox](#) or [TensorFlow Playground](#).



## PREPARE STUDENTS TO BE CRITICAL CONSUMERS, RESPONSIBLE CREATORS, AND INFORMED CITIZENS

It is important to avoid the tendency to think of AI education as primarily preparing those who will work as AI specialists. Only a vanishingly small portion of all students will pursue that career path. On the other hand, all students – regardless of career choice – will need to be critical consumers of AI as they determine whether, for example, they believe that the benefits of using an AI tool outweigh its environmental cost or whether the potential for historical biases in the tool's training data imply that the tool's output should not be trusted. Similarly, as citizens, they will benefit from developing well-informed and thoughtful positions about topics such as the advisability of regulating AI.

# [csteachers.org/ai-priorities](https://csteachers.org/ai-priorities)



1. Introduction
2. The Process
3. Foundational K-12 AI Learning Outcomes
4. Promising Practices for Teaching K-12 AI
5. AI Curriculum Alignment
6. Recommendations for AI4K12 Guidelines
7. Priorities for Future K-12 AI Education Research
8. Tensions and Challenges

[csteachers.org/join](https://csteachers.org/join)



**Jake Baskin**  
Executive Director  
Computer Science  
Teachers Association

Thank you

# AI in Environmental Education

## Thinking Beyond Efficiency

Joan Haley, Ed.D  
Co-Founder, [Greentime.ai](#)  
Executive Director, [Education for Climate Resilience](#)

Presentation for the North American Association for Environmental  
Education  
August 20, 2025

# Starting with Gratitude

Thanks to NAAEE for starting  
this conversation!



We fear things in proportion to our  
ignorance to them ~Christian Nestell  
Bovee

Thinking will not inform fear, but  
action will. ~ W. Clement Stone

Thank you for being here to  
learn and take action!

# Navigating with our EE Hearts and Minds



# Grappling with the potential and pitfalls of AI

The graphic features the word "IMAGINE" in a stylized, lowercase font. Each letter is a different color: I (pink), M (orange), A (yellow), G (green), A (light blue), N (dark blue), and E (purple). The letters are slightly slanted and have a hand-drawn, cursive feel. They are set against a white background with two thin, light gray wavy lines, one above and one below the text.

- Law/Justice - more fair and efficient
- Healthcare - more accurate, customized
- Engineering/Architecture - safer structures, more sustainable
- Governance/democracy - more opportunities to engage, weigh in on policies
- Transportation - safer, quicker, cheaper, more energy efficient

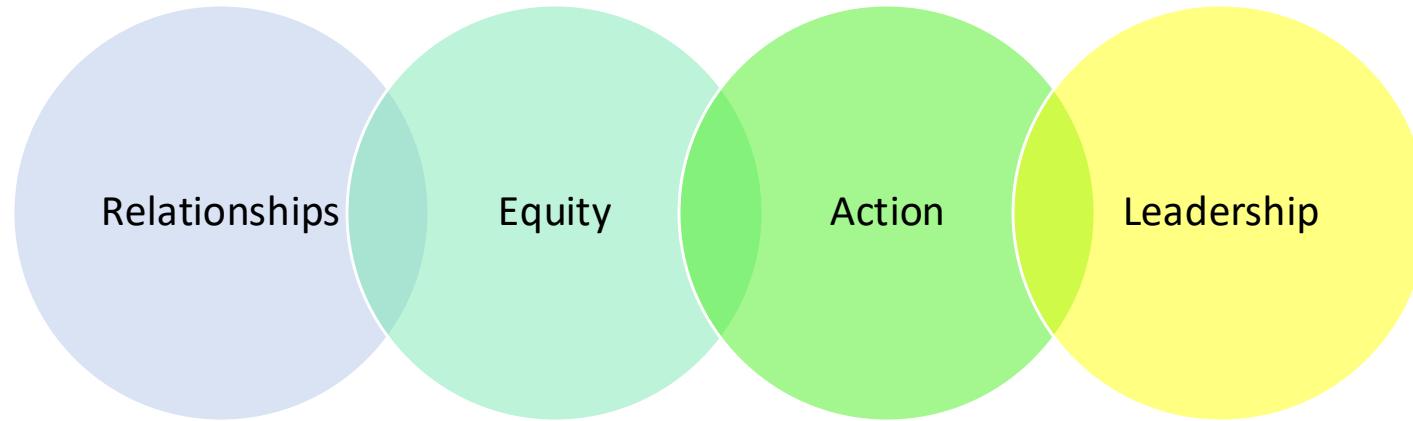
As environmental  
educators,  
what's our role?

# “Do we need to restructure education to focus on what AI can’t do?”



- Project-based learning
- Community service
- Community science
- Flipping the classroom
- Differentiation
- Personalization
- Harkness Method
- Reallocation of resources?

# “What role should AI play in early childhood education, if any?”



We need Emotional Intelligence perhaps more than Artificial Intelligence, but especially with Artificial Intelligence

**Question for you:**

**How can we stay REAL, fostering all of the things we care about in EE in the age of AI?**

# “How is AI's energy consumption being addressed in education?”

**Yes!**

- Surveys show this concern is already in the classroom conversation. [SpringerOpen](#) [Massachusetts, DESE](#)

**And...**

- Need more enough rigorous, peer-reviewed evaluations of *what happens when teachers emphasize AI's environmental footprint* (e.g., knowledge gains, attitude shifts, behavior change) [ScienceDirect](#) [Taylor & Francis Online](#)

## Other Resources to explore

- [ChatGPT Is Everywhere — Why Aren't We Talking About Its Environmental Costs?](#) (TeenVogue)
- [Applying a Critical Climate Education Lens to Generative AI](#) (Nicole May)
- [The Unbearable Lightness of Prompting: A Critical Reflection on the Environmental Impact of genAI use in Design Education](#) (Computer Science > Human-Computer Interaction, Cornell University)
- [Can Large Language Models Bridge the Gap in Environmental Knowledge?](#) (Computer Science > Artificial Intelligence, Cornell University)

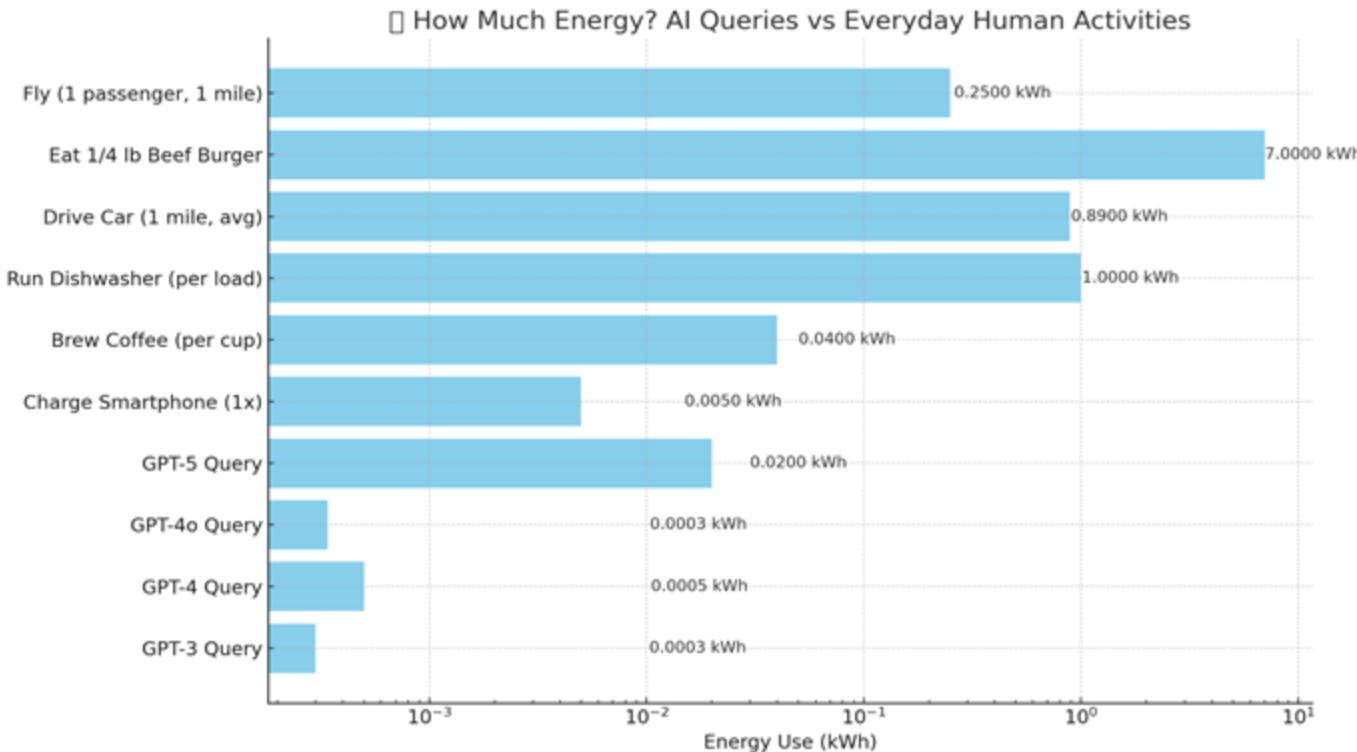
“Are you able to clarify how much energy is actually used in an AI query compared to a traditional Google search (text only)?”

- [A single generative AI text query](#) consumes energy at four or five times the magnitude of a typical search engine request.
- [Generating a single image using AI](#) consumes the same amount of energy as charging a phone to full power.
- [Training one large AI model](#) consumes nearly five times the lifetime emissions of the average American car.
- [Data centers](#)—giant warehouses filled with endless rows of computer servers that are continuously working to complete tasks—used 4 percent of total U.S. electricity in 2023, and that number is expected to jump 7–12 percent in the next three years alone.



“Glad that environmental footprint

is a topic they'll cover. Specific data on what we know (and  
don't) would be helpful”



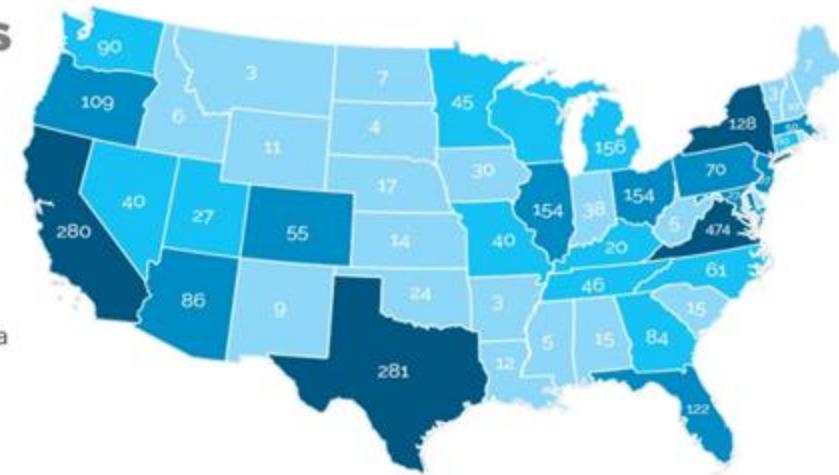
# “Can we look at AI through an environmental justice lens re: energy?”

The US must balance climate justice challenges in the era of artificial intelligence (Brookings Institute)

## DATA CENTERS IN THE US

An estimate of the current number of data centers in each state.  
(2024)<sup>3</sup>

Certain water-scarce regions such as California and Texas have been focal points of data center development.

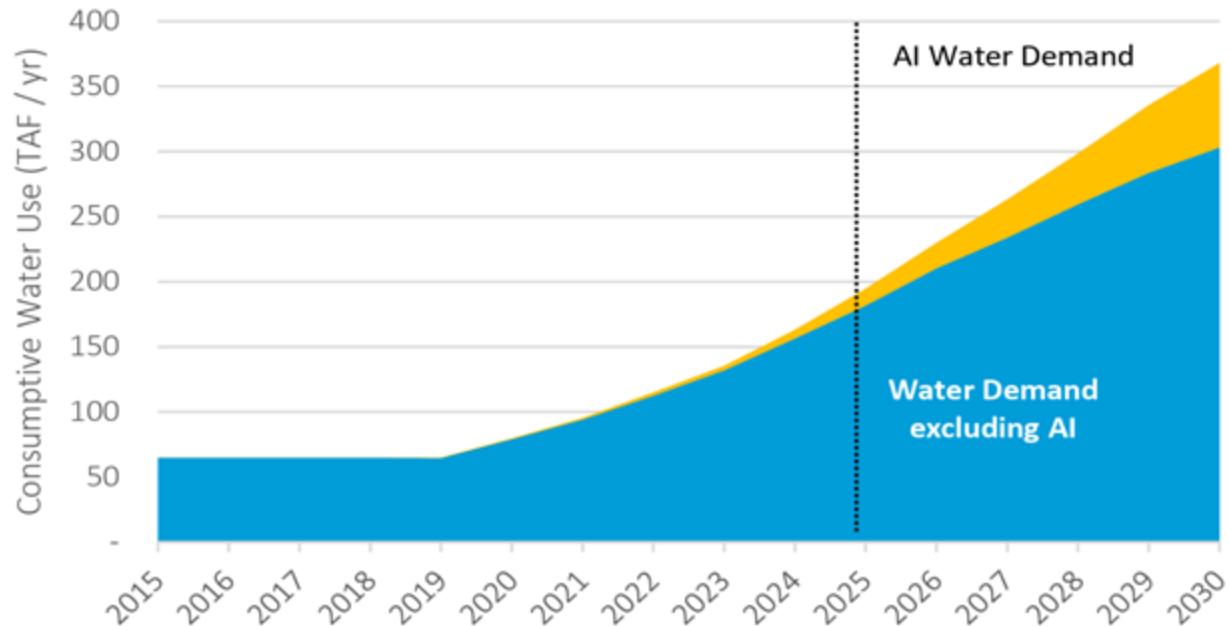


Source: [www.datacentermap.com/usa/](http://www.datacentermap.com/usa/)

“Can we look at AI through an environmental justice lens re: energy?”

## Data Center Water Consumption

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# Energy Usage Bright Spots

- **Amazon** has matched 100% of its operation's global energy consumption with electricity generated by [renewable energy systems](#).
- **Microsoft** established a [supplier code of conduct](#), requiring suppliers to transition to 100% carbon free electricity by 2030, and [has committed to doing the same](#).
- **Google** remains committed to their goal to [rely on carbon-free electricity by 2030](#) and have launched efforts to improve their [AI model efficiency and data-centre energy consumption](#).
- **OpenAI** founder Sam Altman [invested \\$20 million in Exowatt](#), which uses solar power to help meet the needs of OpenAI data centres.
- **Salesforce** announced that it is [lobbying for new regulations to compel companies to report AI emissions data](#) and efficiency standards as part of its [Sustainable AI Policy Priorities](#) initiative.

“How do we ensure data centers are meeting increased demand for AI while ensuring they do not negatively impact communities?”

#### What Communities Can Do:

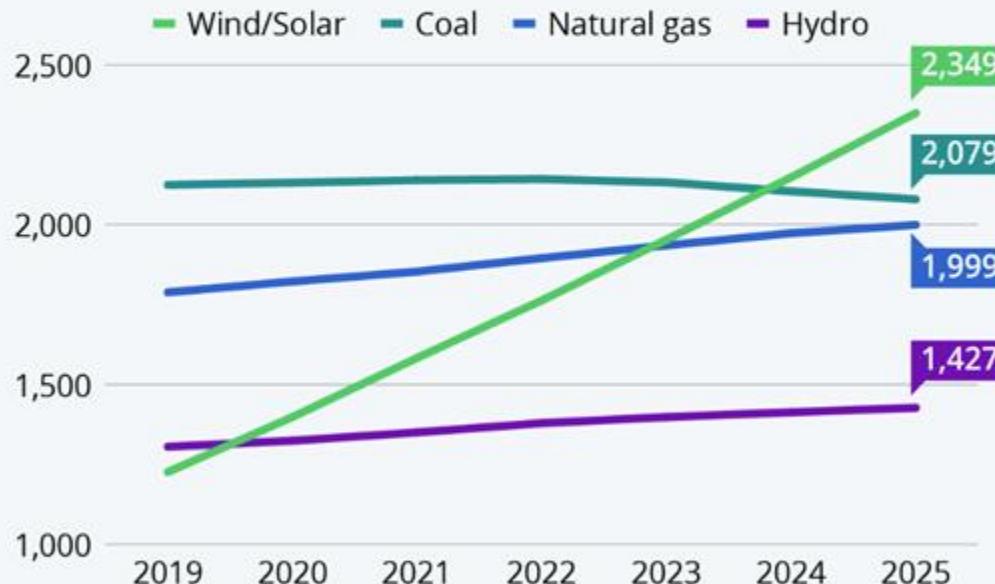
- funding for community power [microgrids](#) that allow rural areas and critical infrastructure to switch between grid-connected and stand-alone operation;
- freshwater [replenishment](#) (for direct use and [indirect](#) use);
- use of [reclaimed wastewater](#) for cooling data centres and [requirements for river restoration](#);
- jobs (not only [during construction](#)), trade and technology training, schools;
- healthcare facilities and programme funding; and
- funding for parks and recreation, farming, public lands and wildlife preservation.

[From myth to metrics: Communities can leverage the real costs of generative AI when negotiating for data centres](#)

# Wind, Solar Dominate Energy Future



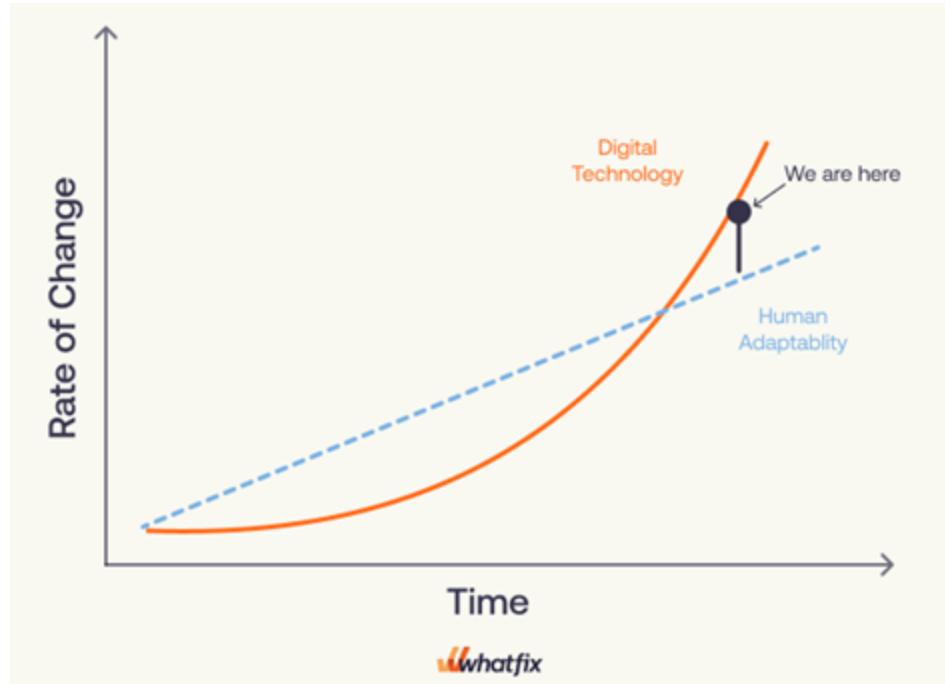
Total global installed power capacity from 2019-2025, by fuel and technology (in gigawatts)



Source: IEA



# So many concerns, so little time.



# What are some tools/resources for discussions about the ethics and environmental impacts of AI?

## Great discussion starters!

- Naglee, Kathleen Naglee . Symbiotic Intelligence : A Roadmap for AI Adoption in K-12 Education
- Tegmark, M. (2017). *Life 3.0: being human in the age of artificial intelligence*. First edition. Alfred A. Knopf
- [AI Guidelines from UNESCO](#)

## AI trends, including some trends in education

- [Technology Adoption Curve: 5 Stages of Adoption](#) (What Fix Blog)
- [What A True Growth Mindset Looks Like In The Age Of AI](#) (Forbes)
- [Google Classroom is getting supercharged with powerful, new teacher-led AI tools](#)
- [ChatGPT vs Claude vs Gemini: I Used All Three to Save 10 Hours a Week – Here's What Actually Worked](#)
- [Trends – Artificial Intelligence \(AI\)](#) (Mary Meeker / Jay Simons / Daegwon Chae / Alexander Krey)

## Environmental Impacts

- [The Uneven Distribution of AI's Environmental Impacts](#) (Harvard Business Review)
- [How AI use impacts the environment and what you can do about it](#) (World Economic Forum)
- [Environmental Impact of AI](#) (National Education Association)
- [Environmental Impacts of Artificial Intelligence: Peril, Promise, and Policy](#) (Society for Industrial and Applied Math)
- [AI Compute and Climate Change](#) (OECD)
- [Data Centers and Water Consumption](#) (Environmental and Energy Study Institute)
- [Explained: Generative AI's environmental impact](#) (MIT News)

# “What are some tools/resources for discussions about the ethics and environmental impacts of AI?



# What is “ethically using ai”? Is it even possible? How can we talk to our colleagues about ethically using or not using ai?

## Navigating AI Ethics: An Ecosystem Framework for Environmental Educators

Dive into the complexities of AI ethics through an ecological lens. Explore the interconnected elements of the AI Ethical Ecosystem to understand development, deployment, governance, and societal impact. This session offers a practical framework and hands-on activities to help environmental educators thoughtfully integrate AI and empower human flourishing in their work.

**Day: Tuesday, November 4**

**Time: 12:00pm to 1:00pm Eastern Standard Time**



The AI Ethical Ecosystem



Choosing AI Tools



Using AI Tools



thank  
you!

**Joan F Haley, Ed.D**

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Resilience.org  
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# THANK YOU FOR JOINING US!



# AI, EDUCATION, AND ETHICS FOR A CHANGING WORLD



**Joan Haley**  
Shelburne  
Farms



**Jake Baskin**  
Computer  
Science  
Teachers  
Association



**Edwin Goutier**  
LaunchPath

*Recording coming soon!*

A dynamic photograph of a herd of horses running across a field of tall, golden grass. The horses are of various colors, including white, brown, and dark brown. They are captured in mid-stride, with their manes and tails flowing. In the background, there are rolling hills and mountains under a clear sky.

**FORWARD  
TOGETHER**

**22ND ANNUAL  
RESEARCH  
SYMPOSIUM**  
October 30

**54TH ANNUAL  
CONFERENCE**  
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# WHERE WILL WE GROW NEXT?



**Let us know what topics you'd like  
us to dig into in future webinars!**

Thank you for joining us!

