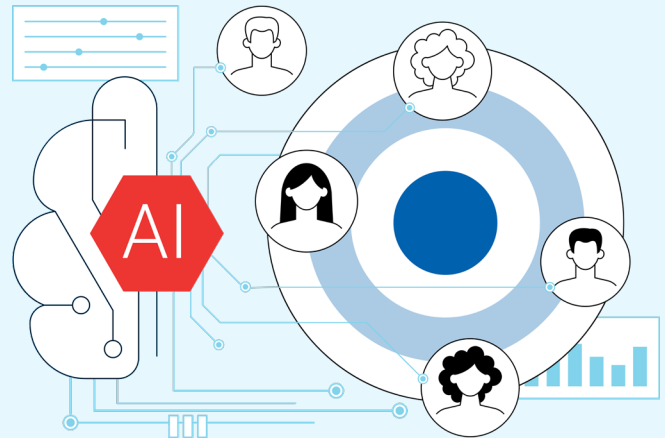
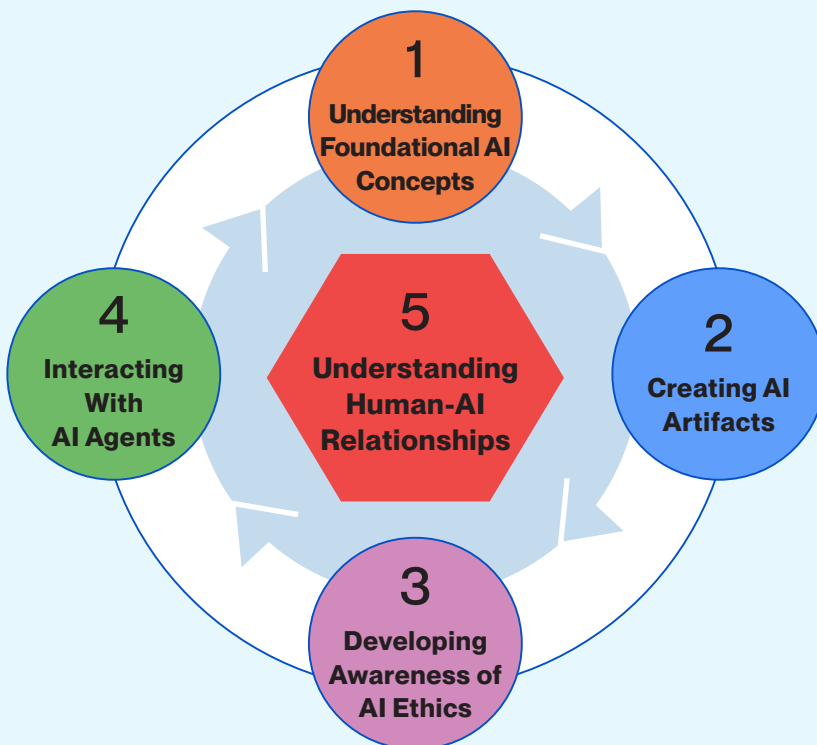


## How are we teaching and learning about AI literacy in K–12?

- SRI researchers reviewed existing studies to understand how AI literacy is taught across grade levels and what components are emphasized in each grade band.
- Our findings show AI literacy can begin at a young age.
- This work supports existing frameworks (such as the [Five Big Ideas and guidelines of AI](#)) and highlights new opportunities for future research and classroom practice.



## What are the five key components of AI literacy emphasized in global K–12 research?



- 1 Background knowledge about AI, AI vocabularies, interdisciplinary topics, and the Five Big Ideas of AI: Perception, Representation and Reasoning, Learning, Human-AI Interaction, and Societal Impact [1].
- 2 Practical skills related to constructing and creating AI systems, artifacts, and solutions [2].
- 3 Awareness of ethical principles related to creating and using AI-based products, privacy and information security, algorithm bias, and methods to mitigate biases [3].
- 4 Practices related to communicating about AI and leveraging AI agents, systems, or technologies in solving problems [4].
- 5 Cultivating perspectives for AI readiness and AI self-efficacy, especially on understanding human roles in developing, evaluating, and leveraging AI systems for social good [5].



# How can we help students develop AI literacy from an early age?



## Understanding Foundational AI Concepts

Students in grades K–3 can grasp AI basics through language, drawing, and movement to describe how AI systems “learn.”

Students in grades 4–6 can begin to understand how AI processes data and makes decisions.



## Interacting With AI Agents

For elementary school students, AI literacy competencies related to interacting with AI agents range from observing AI agents’ behaviors to assessing how these agents function and respond to various inputs.



## Developing Awareness of AI Ethics

In grades K–3, students can discuss how “smart,” “friendly,” or “truthful” an AI seems and begin to recognize that AI systems can reflect biases in their training data.

In grades 4–6, students can evaluate AI outputs, understanding what AI knows (and doesn’t know) and how this affects decision-making.



## Understanding Human-AI Relationships

In grades K–3, students can learn about how AI can assist and improve people’s lives (e.g., the role and functions of robots in cleaning floors).

In grades 4–6, students explore the critical role humans play in developing AI and the ethical implications and responsibilities associated with AI technologies.



## Creating AI Artifacts

In grades K–3, students can train simple AI models on no-code, game-based platforms.

In grades 4–6, students can use tangible computing tools to create AI-powered projects like intelligent garbage cans to sort recycling items.

## From Awareness to Action: Translating AI literacy competencies into reflective classroom questions for K-12 teachers

### Understanding Foundational AI Concepts

How would you explain AI to your students?

What misconceptions do you think your students have about AI?

How can you address those misconceptions effectively?

### Creating AI Artifacts

If you were to integrate AI creation activities into different subjects (e.g., art, science, language arts), what might these cross-curricular projects look like?

### Interacting With AI Agents

How can you help students not just use AI agents but also critically evaluate their outputs or recommendations? What questions should students be asking?

How do you guide students to use AI tools responsibly (e.g., citing AI-assisted content, verifying sources, understanding potential inaccuracies)?

### Developing Awareness of AI Ethics

How do you talk to students about data privacy (e.g., information shared online)?

How do these discussions tie into understanding AI ethics?

How do you encourage students to spot and question these biases?

### Understanding Human-AI Relationships

In what ways do you see your role evolving as AI tools become more prevalent in education?

How can you help students see themselves as potential creators and responsible users of AI, rather than just passive consumers?

What are some examples of AI being used for social good that you could share with students to inspire them to use AI for positive change?

#### References are examples provided for context, not a comprehensive list:

- [1] Ng, D. T. K., Su, J., & Chu, S. K. W. (2024a). Fostering secondary school students’ AI literacy through making AI-driven recycling bins. *Education and Information Technologies*, 29(8), 9715–9746. <https://doi.org/10.1007/s10639-023-12183-9>
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- [3] Williams, R., Ali, S., Devasia, N., DiPaola, D., Hong, J., Kaputsos, S. P., Jordan, B., & Breazeal, C. (2023). AI + ethics curricula for middle school youth: Lessons learned from

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