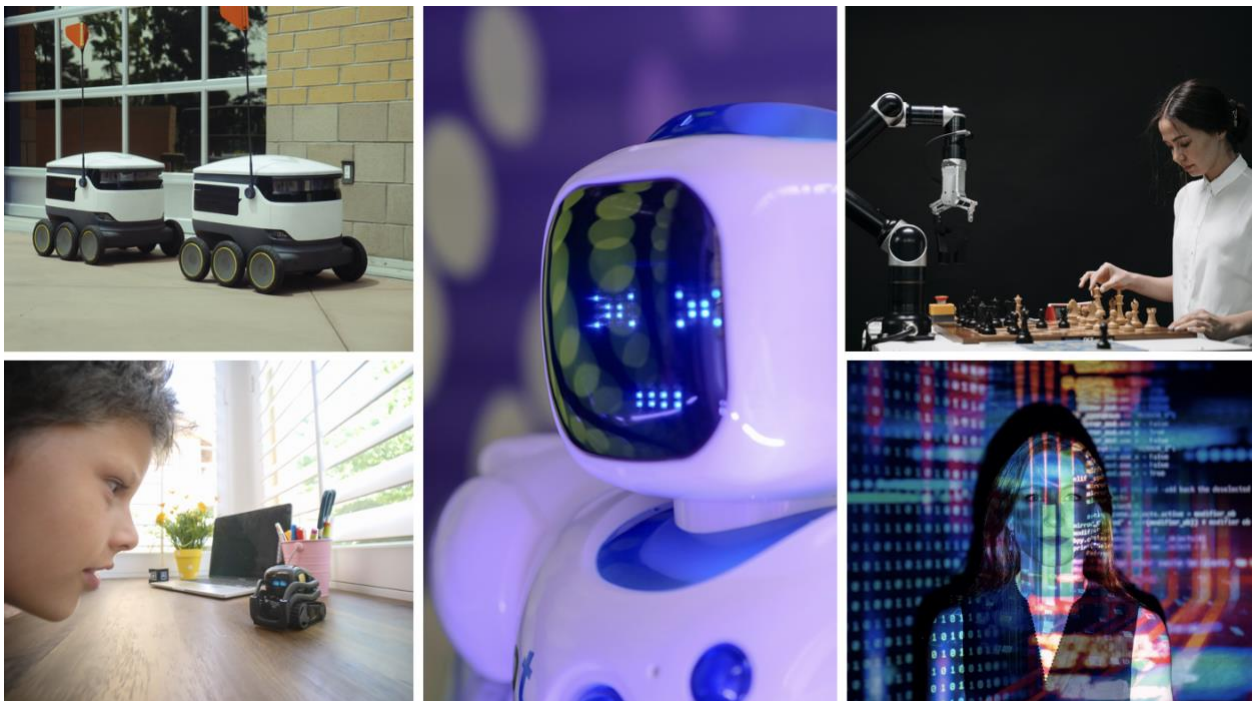


Learning About Artificial Intelligence (AI) in Afterschool



A Briefing Paper

By Sam Piha, ChatGPT and Samantha Fasen

ABOUT THE AUTHORS



Sam Piha (he/him) has served as founder and president of Temescal Associates since 2007. Sam began his career in 1974 as an afterschool worker, an experience that led to 13 years of classroom teaching and work as a child and family counselor and school social worker. Between 1989 and 2006, Sam managed school-based youth programs at the regional and national levels. He later founded Temescal Associates and The How Kids Learn Foundation, both dedicated to improving the quality of afterschool programs. Sam served as editor and contributing author of several important practice guides and journal articles on afterschool programming. Sam holds a master's degree in Social Welfare.



Samantha Fasen (she/her) joined Temescal Associates and the How Kids Learn Foundation in 2019 and has fully embraced her work with the afterschool field. She helps to coordinate and develop marketing campaigns and multimedia elements to reach a wider audience and share with people the importance of out-of-school time and youth development.



Ren Daraio (they/she) brings over 35 years of experience working in the field of youth development as a facilitator, trainer, and coach. She has experience training and coaching diverse audience groups, from afterschool practitioners and parents to funders and technical assistance providers. Prior to her work with Temescal Associates, Ren was the Deputy Director at the Community Network for Youth Development and a consultant for the Institute for Research and Reform in Education.



In the spirit of the AI topic, some of this briefing paper was authored by [ChatGPT](#). Photo Source: www.unsplash.com.

ABOUT THE ORGANIZATIONS

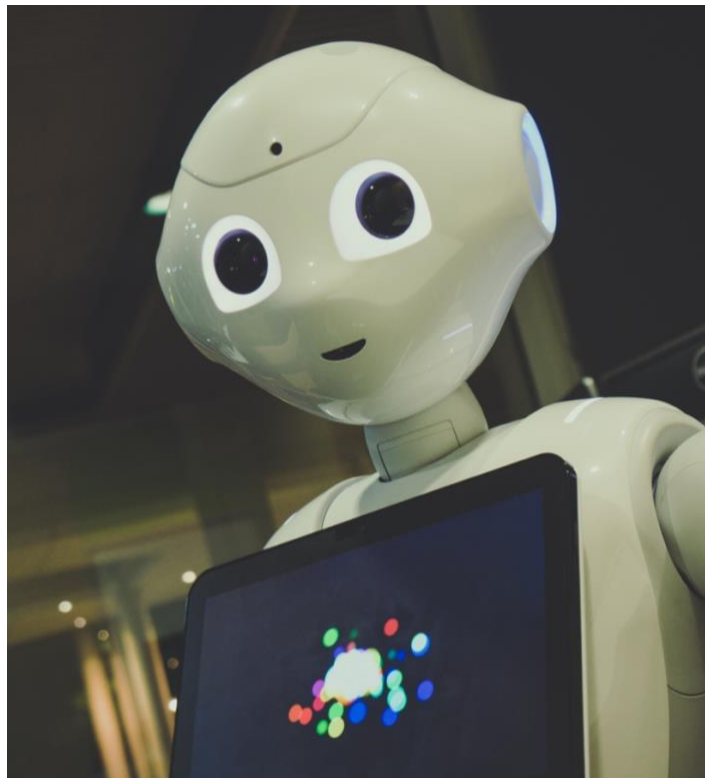
[Temescal Associates](#) is dedicated to building the capacity of leaders and organizations in education and youth development who organizations, and policy makers.

[The How Kids Learn Foundation](#) (HKLf) is a 501(c)(3) organization. It is dedicated to improving the effectiveness of settings that support the education and healthy development of youth. This includes schools and out-of-school time programs. The HKL Foundation provides educational and training activities that promote the capacity of organizations that support the education and healthy development of youth. Examples of activities include conferences, speaker forums, screenings of relevant films, training sessions, coaching sessions, the awarding of digital badges to acknowledge exemplar programs and the learning that happens within these settings. Activities also include the development and distribution of educational materials (papers, self-assessment tools, videos, program guides, etc.). You can see a [catalogue of the resources](#) we've produced for the afterschool field.

Front Cover Photos: All photos from www.pexels.com.

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LEARNING ABOUT ARTIFICIAL INTELLIGENCE (AI) IN AFTERSCHOOL



Source: www.pexels.com

INTRODUCTION

Almost every day there is a piece in the news about the opportunities and dangers of Artificial Intelligence (AI). Many young people, even those who are very tech savvy, know little about this topic. Adults, including those in afterschool programs, know even less. Yet, AI is being used by companies more and more.

We believe that youth need to understand more about AI. Afterschool is a perfect place to do this, but are afterschool leaders equipped for this? (In the spirit of the AI topic, some of this briefing paper was authored by [ChatGPT](#).)

BRIEFING PAPER PURPOSE

This paper is designed to introduce AI, raise understanding and awareness of artificial intelligence and identify ways afterschool leaders can educate their program participants. And if appropriate, offer hands-on experiences allowing youth to engage in AI projects. We recommend that program leaders share this paper with organizational leaders and program staff and consider the best ways to respond to the need to understand what AI is.

WHAT IS ARTIFICIAL INTELLIGENCE?

According to [Inspirit Scholars](#), artificial Intelligence (AI) “is the ability for a computer to think and learn.”. In [Teachers Need PD on Artificial Intelligence. What It Should Look Like](#), author Lauraine Langreo writes “AI technology refers to computers or machines that are programmed to perform tasks that we usually think only humans can do – by copying human thought or behaviour. The technology is used to predict things (e.g. how a virus may spread), make recommendations (e.g. what online videos to watch next), or make decisions (e.g. how an essay should be graded). AI replicates human-like intelligence by training

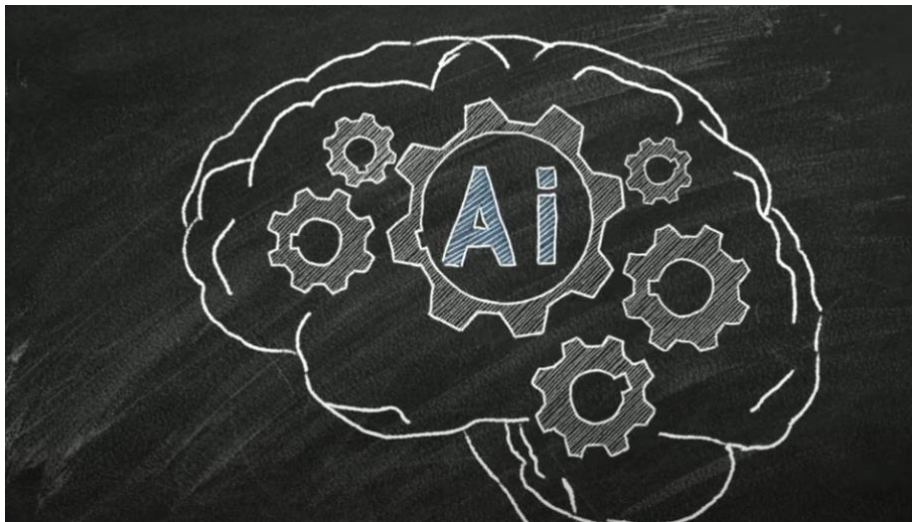
machines and computer systems to do tasks that simulate some of what the human brain can do. It relies on systems that can actually learn, usually by analyzing vast quantities of data and searching out new patterns and relationships. These systems can actually improve over time, becoming more complex and accurate as they take in more information.”

When prompted with “What is AI?” ChatGPT replied, “AI stands for Artificial Intelligence. It is a branch of computer science that focuses on creating intelligent machines that can perform tasks that typically require human intelligence. These tasks can include understanding natural language, recognizing images and patterns, learning from experience, making decisions, and solving problems.

AI encompasses various techniques and approaches, including machine learning, natural language processing, computer vision, robotics, and more. Machine learning, in particular, has been a crucial driving force behind many AI advancements, allowing systems to learn from data and improve their performance over time without explicit programming for every task.

The development of AI has significant implications for numerous industries, including healthcare, finance, transportation, education, and entertainment. It also raises important ethical and societal questions, as the technology becomes more prevalent and integrated into various aspects of daily life. As AI continues to evolve, its potential impact on society will undoubtedly be a topic of ongoing discussion and exploration.”

To learn more about introducing AI to young people, check out this brief video by Inspirit Scholars entitled, [What is AI for Kids? An Introduction to Artificial Intelligence for Kids.](#)



[Source: Inspirit Scholars](#)

EXAMPLES OF AI TECHNOLOGY

All of the examples, below, use artificial intelligence. Many AI computers can perform tasks that are typically done by people, including processing language, problem-solving, and learning. Artificial intelligence examples include:

- [Self-driving cars](#)
- [“Alexa” or Apple’s “Siri”](#)
- [iPhone’s face recognition](#)

- Movie Recommendations: If you have ever streamed a movie, you may receive recommendations for other movies based on what you have watched already. That's because of AI!
- Chatbots: Many websites have chatbots that help answer your questions. Most are run by AI.
- Search Engines: Search engines, like Google use AI to rank websites in your search results.



Source: www.unsplash.com

WHAT ARE THE BENEFITS OF AI?

When prompted with “What are the benefits of AI?”, ChatGPT replied, “AI offers numerous benefits across various domains, and its potential impact on society is significant. Here are some of the key benefits of AI:

- **Automation and Efficiency**: AI can automate repetitive and time-consuming tasks, leading to increased efficiency and productivity. This allows humans to focus on more complex and creative aspects of their work.
- **Improved Decision Making**: AI systems can analyze vast amounts of data quickly and make data-driven decisions. This can lead to more informed and accurate choices in various fields, such as finance, healthcare, and business.
- **Personalization**: AI-powered recommendation systems can personalize user experiences in online shopping, entertainment, and content consumption, enhancing customer satisfaction and loyalty.
- **Enhanced Customer Service**: AI-driven chatbots and virtual assistants provide 24/7 customer support, improving response times and customer service quality.
- **Medical Advancements**: AI has the potential to revolutionize healthcare by enabling faster and more accurate diagnosis, drug discovery, and personalized treatment plans.
- **Safer and Smarter Transportation**: AI can be used in autonomous vehicles and traffic management systems, leading to safer roads and more efficient transportation networks.
- **Environmental Impact**: AI can be leveraged for environmental monitoring and conservation efforts, helping to address challenges like deforestation, climate change, and wildlife protection.
- **Precision Agriculture**: AI can optimize agricultural processes by analyzing data on soil quality, weather patterns, and crop health, leading to increased yields and reduced resource wastage.
- **Language Translation**: AI-powered language translation tools can bridge communication gaps and promote cross-cultural understanding.

- **Disaster Response:** AI can assist in disaster response efforts by analyzing data to predict and mitigate the impact of natural disasters.
- **Scientific Research:** AI accelerates scientific research by analyzing large datasets, simulating complex models, and aiding in data interpretation.
- **Education and Learning:** AI can personalize education, providing tailored learning experiences for students and offering additional support to learners with different needs.”

ARTIFICIAL INTELLIGENCE COMES WITH RISKS

Bernard Marr (Forbes) in [The 15 Biggest Risks Of Artificial Intelligence](#) writes “AI does present some significant dangers — from job displacement to security and privacy concerns — and encouraging awareness of issues helps us engage in conversations about AI’s legal, ethical, and societal implications.” Marr describes in detail about the biggest fears and risks of artificial intelligence:

- | | |
|--------------------------|----------------------------------|
| -Lack of Transparency | -Economic Inequality |
| -Bias and Discrimination | -Legal and Regulatory Challenges |
| -Privacy Concerns | -AI Arms Race |
| -Ethical Dilemmas | -Loss of Human Connection |
| -Security Risks | -Misinformation and Manipulation |
| -Concentration of Power | -Unintended Consequences |
| -Dependence on AI | -Existential Risks |
| -Job Displacement | |

Many believe that the best way to mitigate the risks of artificial intelligence is to develop national and international regulations.

WHAT SHOULD AFTERSCHOOL EDUCATORS KNOW ABOUT AI?

It’s important for educators to understand AI so they can help their youth make sense of a technological development that experts predict will be a huge force in the world. It’s crucial for educators to be AI literate, to be able to explain what it is, and to understand its powers and limitations.

WHAT CAN AFTERSCHOOL PROGRAMS DO TO GET STARTED?

Adding discussions and/or projects regarding artificial intelligence requires some preparation. Below are some steps to consider:

- **Gather information:** It is useful to determine what stakeholders already know about AI and what they want to learn about. In her article [What is AI for Kids? An Introduction to Artificial Intelligence for Kids](#), author Maddie Bradshaw presents some discussion questions that are appropriate for adults and youth:
 - What do you think of when someone says AI?
 - How are AI technologies already a part of your daily life?
 - What excites and worries you about AI?
 - What more would you like to learn about AI?
- **Visit other afterschool programs to see what they are doing with AI:** Identify other afterschool programs that are teaching about or using AI. In addition to seeing what they’re doing, you can ask them about materials and challenges.
- **Staff Professional Development:** As stated above it’s important for program staff to understand AI so they can help their youth make sense of this technological development. It’s crucial for

educators to be AI literate, to be able to explain what it is, and to understand its powers and limitations. You can send one staff member to a training to learn about AI in depth and schedule a training session for all staff on the topic of AI.



Source: Temescal Associates

- **AI projects in afterschool:** When prompted with “What are some examples of AI projects in afterschool?”, ChatGPT replied, “AI projects for afterschool youth programs can be both fun and educational, providing students with valuable skills in programming, problem-solving, and critical thinking. Here are some AI project ideas suitable for youth programs:

- **Chatbot:** Create a simple chatbot using natural language processing (NLP) techniques. Students can design a chatbot to answer questions on a specific topic or simulate a conversation with historical figures or fictional characters.
- **Image Recognition:** Teach students the basics of computer vision by building an image recognition project. They can create a model to identify objects, animals, or even emotions from images.
- **Game AI:** Introduce students to game development and AI by having them build an AI opponent for a game. They can experiment with different strategies and difficulty levels.
- **Sentiment Analysis:** Analyze the sentiment of text data, like tweets or movie reviews, to determine if the content is positive, negative, or neutral using natural language processing techniques.
- **Recommendation System:** Help students build a recommendation system like those used by streaming platforms or online stores. They can suggest movies, music, books, or products based on user preferences.
- **AI Art Generator:** Explore the creative side of AI by building a system that generates art, poetry, or music using AI algorithms like Generative Adversarial Networks (GANs) or Recurrent Neural Networks (RNNs).
- **Self-Driving Car Simulation:** Use simulators to create a virtual self-driving car and teach students the basics of autonomous vehicle technology.
- **Predictive Analytics:** Introduce students to data analysis and predictive modeling. They can work on projects like predicting weather patterns or stock market trends.
- **Healthcare AI:** Students can explore AI applications in healthcare, such as developing a system to detect specific diseases from medical images.

- **AI Ethics Discussion:** Engage students in discussions about the ethical implications of AI, including bias in algorithms and privacy concerns.

Remember, the difficulty and complexity of the projects should be tailored to the age and experience level of the students. These projects not only make AI more accessible to young learners but also encourage creativity and innovation as they explore the possibilities of this exciting field.”

WE WANT TO HEAR FROM YOU!



Source: Temescal Associates

- What are you doing to help afterschool staff and participants to better understand artificial intelligence?
- Would you add any additional resources that would be valuable to afterschool stakeholder?
- Comments?

Email us at info@temescalassociates.com.

AI TERMS AND DEFINITIONS

Below are some common and more esoteric AI terms and definitions that may be helpful.

- **Afterschool programs** - Community-based and school-based youth programs that are conducted before or after the school day and during the summer. These programs are also referred to as afterschool, out-of-school time (OST), youth programs or summer learning programs.
- **Artificial Intelligence (AI)**- “AI is a machine’s ability to perform the cognitive functions we associate with human minds, such as perceiving, reasoning, learning, interacting with an environment, problem solving, and even exercising creativity. You’ve probably interacted with AI even if you didn’t realize it—voice assistants like Siri and Alexa are founded on AI technology, as are some customer service chatbots that pop up to help you navigate websites.” - [What is AI?](#)
- **ChatGPT**- “An AI chatbot that uses natural language processing to create humanlike conversational dialogue. The language model can respond to questions and compose various written content, including articles, social media posts, essays, code and emails. ChatGPT is similar to the automated chat services found on customer service websites, as people can ask it questions or request clarification to ChatGPT’s replies. The GPT stands for “Generative Pre-trained Transformer,” which refers to how ChatGPT processes requests and formulates responses.” – [Definition ChatGPT](#)
- **Algorithm**- “A procedure used for solving a problem or performing a computation. Algorithms act -as an exact list of instructions that conduct specified actions step by step in either hardware- or software-based routines. Algorithms are widely used throughout all areas of IT. In mathematics and computer science, an algorithm usually refers to a small procedure that solves a recurrent problem. Algorithms are also used as specifications for performing data processing and play a major role in automated systems.” – [Definition Algorithm](#)

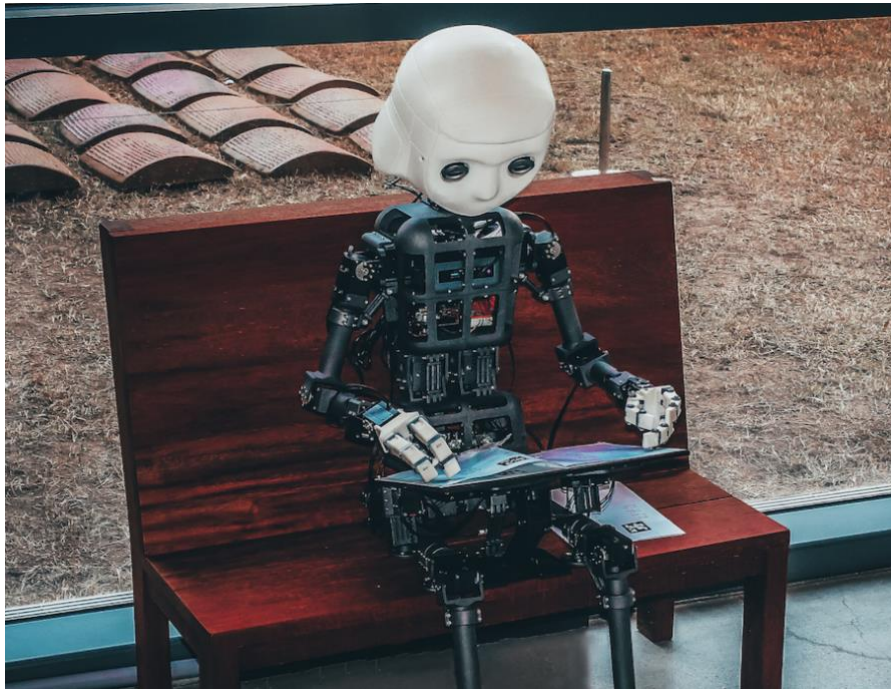
- Deepfake- “A deepfake is an image, or a video or audio recording, that has been edited using an algorithm to replace the person in the original with someone else (especially a public figure) in a way that makes it look authentic.” – [Definition Deepfake](#)
- Strong AI- “Also known as [artificial general intelligence](#), is a machine that can solve problems it’s never been trained to work on — much like a human can. This is the kind of AI we see in movies, like the robots from Westworld or the character Data from Star Trek: The Next Generation. This type of AI doesn’t actually exist yet.” - [What is Artificial Intelligence?](#)
- Weak AI- “Sometimes referred to as narrow AI or specialized AI, operates within a limited context and is a simulation of human intelligence applied to a narrowly defined problem (like driving a car, transcribing human speech or curating content on a website). Weak AI is often focused on performing a single task extremely well. While these machines may seem intelligent, they operate under far more constraints and limitations than even the most basic human intelligence. Weak AI examples include: Siri, Alexa and other smart assistants, self-driving cars, Google search, email spam filters, and Netflix’s recommendations.” - IBID
- Machine Learning (ML)- “A machine learning algorithm is fed data by a computer and uses statistical techniques to help it “learn” how to get progressively better at a task, without necessarily having been specifically programmed for that task. Instead, ML algorithms use historical data as input to predict new output values.” -IBID
- Deep Learning – “A type of machine learning that runs inputs through a biologically inspired neural network architecture. The neural networks contain a number of hidden layers through which the data is processed, allowing the machine to go “deep” in its learning, making connections and weighing input for the best results.” - IBID
- The Four Types of AI- “AI can be [divided into four categories](#), based on the type and complexity of the tasks a system is able to perform. They are reactive machines, limited memory, theory of mind, and self-awareness.” - IBID
- Reactive Machines- “A reactive machine follows the most basic of AI principles and, as its name implies, is capable of only using its intelligence to perceive and react to the world in front of it. A reactive machine cannot store a memory and, as a result, cannot rely on past experiences to inform decision making in real time. Perceiving the world directly means that reactive machines are designed to complete only a limited number of specialized duties. Reactive Machine examples include [Deep Blue](#), which was designed by [IBM](#) in the 1990s as a chess-playing [supercomputer](#) and defeated international grandmaster Gary Kasparov in a game.” – IBID
- Limited Memory- “Limited memory AI has the ability to store previous data and predictions when gathering information and weighing potential decisions — essentially looking into the past for clues on what may come next. Limited memory AI is more complex and presents greater possibilities than reactive machines.” – IBID



Source: www.pexels.com

- Theory of Mind- *“Theory of mind is just that — theoretical. We have not yet achieved the technological and scientific capabilities necessary to reach this next level of AI. The concept is based on the psychological premise of understanding that other living things have thoughts and emotions that affect the behavior of one’s self. In terms of AI machines, this would mean that AI could comprehend how humans, animals and other machines feel and make decisions through self-reflection and determination, and then utilize that information to make decisions of their own. Essentially, machines would have to be able to grasp and process the concept of ‘mind,’ the fluctuations of emotions in decision-making and a litany of other psychological concepts in real time, creating a two-way relationship between people and AI.” – IBID*
- Self-Awareness- *“Once theory of mind can be established, sometime well into [the future of AI](#), the final step will be for AI to become self-aware. This kind of AI possesses human-level consciousness and understands its own existence in the world, as well as the presence and emotional state of others. It would be able to understand what others may need based on not just what they communicate to them but how they communicate it. Self-awareness in AI relies both on human researchers understanding the premise of consciousness and then learning how to replicate that so it can be built into machines.” - IBID*

ADDITIONAL RESOURCES



Source: www.unsplash.com

In addition to the articles that are linked above, we list some links below that may be helpful.

ARTICLES

- [*AI Guide for Teens*](#)
- [*The A-Z of AI*](#)
- [*The Impact of Artificial Intelligence on Kids and Teens*](#)
- [*What is Artificial Intelligence? AI for Kids and Teens*](#)
- [*Adolescent Perspectives on Artificial Intelligence*](#)
- [*AI Literacy, Explained*](#)
- [*Artificial Intelligence \(AI\): What is AI and How Does It Work?*](#)

WEBSITES PROVIDING AI INFORMATION, CURRICULUM, MATERIALS, ETC.

- [*Inspirit AI*](#)
- [*The AI Education Project*](#)
- [*Day of AI*](#)

VIDEOS FOR KIDS

- [*What is AI for Kids? An Introduction to Artificial Intelligence for Kids*](#)
- [*What is Artificial Intelligence for Kids?*](#)
- [*What is Artificial Intelligence?*](#)
- [*Artificial Intelligence \(AI\) & Robotics for Kids*](#)