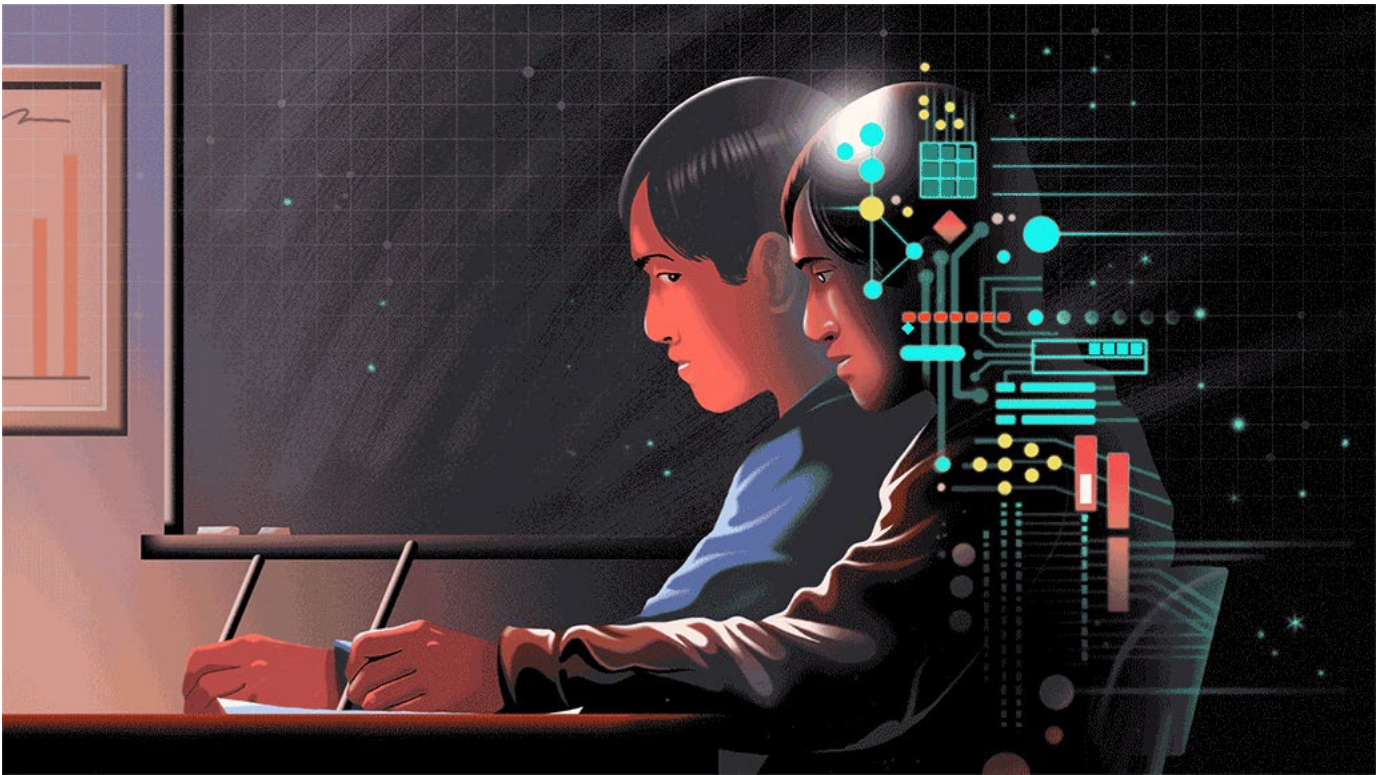


ScienceNews

EDUCATOR GUIDE



GLENN HARVEY

April 8, 2023

**Homework Help? ChatGPT is Poised
to Disrupt Education**





April 8, 2023

Homework Help? ChatGPT is Poised to Disrupt Education

About this Guide

Playing around with ChatGPT is enormously fun, and the technology can be useful. But there are pitfalls too. In this Guide, students will learn about AI and the benefits and challenges posed by the chatbot.

This Guide includes:

Article-based Comprehension Q&A — Students will answer questions about the online *Science News Explores* article "[Think twice before using ChatGPT for help with homework](#)," which explains the pros and cons of using ChatGPT. A version of the article, "Homework Help? ChatGPT and other AI tools are poised to disrupt education," appears in the April 8, 2023 issue of *Science News*. Related standards include NGSS-DCI: MS-ETS1; HS-ETS1.

Student Comprehension Worksheet — These questions are formatted so it's easy to print them out as a worksheet.

Cross-curricular Discussion Q&A — Students will discuss the meaning of AI and its uses before testing their ability to distinguish between answers written by students and answers written by ChatGPT. After taking a ChatGPT quiz produced by *Science News Explores*, students will talk about their results and the educational and ethical implications of using the chatbot. A version of the article, "Homework Help? ChatGPT and other AI tools are poised to disrupt education," appears in the April 8, 2023 issue of *Science News*. Learning Outcomes: Develop an understanding of artificial intelligence and apply that knowledge to current technologies that use Related standards include NGSS-DCI: MS-ETS1; HS-ETS1

Student Discussion Worksheet — These questions are formatted so it's easy to print them out as a worksheet.

April 8, 2023

**Homework Help? ChatGPT is
Poised to Disrupt Education****Article-based Comprehension, Q&A**

Directions for teachers: Ask students to read the online *Science News Explores* article "[Think twice before using ChatGPT for help with homework](#)" and have them answer the following questions. A version of the article, "Homework Help? ChatGPT and other AI tools are poised to disrupt education," appears in the April 8, 2023 issue of *Science News*.

A special thanks goes out to the Science News Learning teachers who sought student responses to the questions used in the ChatGPT quiz. Some of the students' answers were used in the quiz and are highlighted in the *Science News* articles about ChatGPT. Although there wasn't room to publish every student response, each response was reviewed and supported the project. To stay informed about future opportunities like this one, check out the weekly Science News Learning Friday newsletter. You can receive the newsletter by [signing up for our resources](#).

1. What is ChatGPT, and what can it do?

ChatGPT is an artificial intelligence (AI) chatbot that will respond to prompts with answers. This chatbot can write essays, summaries and stories that sound natural. It also can write code.

2. What challenges does ChatGPT cause in education right now? What actions have schools taken and why?

Educators and schools haven't had time to develop protocols for using ChatGPT to best support student learning. Educators are concerned that students might use ChatGPT to cheat on assignments and tests or might submit ChatGPT writing as their own, without citation. The educators also believe students might not learn how to solve problems or think critically if they depend on ChatGPT. Because the chatbot makes mistakes, educators worry that students will produce inaccurate work. These concerns have led some schools and teachers to ban ChatGPT.

3. According to the article, what are some ways ChatGPT can benefit students?

One teacher quoted in the article suggested that ChatGPT can be used to coach students as they learn to write. For example, students could pick and choose from ideas generated by ChatGPT to develop their writing projects. ChatGPT could be helpful to students working in a second language, and the chatbot could also tutor in difficult subjects.

4. What are some limitations of ChatGPT? What can humans do that ChatGPT can't?

Depending on the training data, what ChatGPT knows might not be current. ChatGPT also makes up information and makes up references; it cannot be trusted to present facts. Unlike humans, ChatGPT can't reason or have thoughts and ideas of its own.

5. Often ChatGPT generates the wrong answer to a prompt. What causes this AI tool to make mistakes?

ChatGPT makes mistakes because it does not pull facts from a database, and it combines language without understanding what the words mean.

6. How did OpenAI train ChatGPT?

OpenAI used a large language model to train ChatGPT. The model relied on an artificial neural network that looks for patterns in data and learns to predict what order words are likely to appear in a sentence. Books, journals, dialog, essays and exams were used in ChatGPT's training. More recently, OpenAI used a different kind of machine learning called reinforcement learning with human feedback to fine-tune ChatGPT.

7. Find an example in the article where people were fooled by ChatGPT.

Catherine Gao, a medical researcher at Northwestern University, asked reviewers to distinguish between real scientific abstracts and ChatGPT-generated abstracts. She found that reviewers thought one in three abstracts generated by ChatGPT had been created by a human.

April 8, 2023

Homework Help? ChatGPT is Poised to Disrupt Education

Student Comprehension Worksheet

Directions: Please read the online *Science News Explores* article "[Think twice before using ChatGPT for help with homework](#)" and answer the following questions. A version of the article, "Homework Help? ChatGPT and other AI tools are poised to disrupt education," appears in the April 8, 2023 issue of *Science News*.

1. What is ChatGPT, and what can it do?

2. What challenges does ChatGPT cause in education right now? What actions have schools taken and why?

3. According to the article, what are some ways ChatGPT can benefit students?

4. What are some limitations of ChatGPT? What can humans do that ChatGPT can't?

5. Often ChatGPT generates the wrong answer to a prompt. What causes this AI tool to make mistakes?

6. How did OpenAI train ChatGPT?

7. Find an example in the article where people were fooled by ChatGPT.

April 8, 2023

**Homework Help? ChatGPT is
Poised to Disrupt Education****Cross-curricular Discussion, Q&A**

Directions for teachers: Ask students to read the short *Science News Explores* articles “[Let’s learn about artificial intelligence](#)” and “[Scientists Say: Machine learning](#),” and then discuss the first set of prompts. Before discussing the second set of prompts, have students read “[Think twice before using ChatGPT for help with homework](#),” also from *Science News Explores*, and take the quiz at the end of the article. A version of the article, “Homework Help? ChatGPT and other AI tools are poised to disrupt education,” appears in the April 8, 2023 issue of *Science News* — but the print version gives away the quiz answers!

A special thanks goes out to the Science News Learning teachers who sought student responses to the questions used in the ChatGPT quiz. Some of the students’ answers were used in the quiz and are highlighted in the *Science News* articles about ChatGPT. Although there wasn’t room to publish every student response, each response was reviewed and supported the project. To stay informed about future opportunities like this one, check out the weekly Science News Learning Friday newsletter. You can receive the newsletter by [signing up for our resources](#).

Want to make it a virtual lesson? Post the online *Science News Explores* article to your virtual classroom. Discuss the article and questions with your class on your virtual platform.

Alexa, Explain AI

1. What does AI stand for and what does it do? Why do you think AI got the name that it did?

AI stands for artificial intelligence, which means that a machine or computer program can perform tasks that require thought processing in humans, such as visual perception, speech recognition, decision making and language translation. Because “artificial” means that something is not produced naturally and is instead created by humans, the phrase “artificial intelligence” means that humans are creating ways to model intelligence.

2. Discuss common uses of AI mentioned in the *Science News Explores* articles. Based on these examples, what areas can you think of where AI is used?

Examples discussed in the articles include phone navigation apps, self-driving cars, streaming services that suggest products, virtual translators and disease diagnoses applications. Other applications of AI include face-recognition technology, self-driving package delivery systems, drones, gaming and service robots.

3. Much of today’s AI is based on machine learning. Explain how two types of machine learning — supervised learning and reinforcement learning — are different. What do you think “unsupervised learning” means? Hint: It is another kind of machine learning.

Supervised learning involves a computer learning patterns from a large, labeled training data set to achieve a certain task or solve a certain problem. Reinforcement learning is when a computer learns how to interact with an environment of data to achieve a certain goal. If the computer is successful, it receives positive feedback about its pathway, and if not, the computer receives negative feedback. The computer continually adjusts based on the feedback. Unsupervised learning occurs when a computer learns from an unlabeled data set and explores data sets to find patterns and information.

4. After analyzing the different types of machine learning, discuss the similarities among the types to explain generally how AI computers learn.

AI computers are given data that are either labeled or unlabeled. The computer is asked to interact with the data to either identify patterns or complete a task. What characterizes machine learning generally is that the computers learn from experience, sort of like humans.

5. Discuss examples of AI in art, movies, books and television shows. Choose an example and talk about how AI was used in the work and note which parts are still science fiction and which parts are now real.

Student answers will vary, but they might mention films that depict self-driving cars or other technologies that rely on real or imagined AI or films where AI itself is a character. Films where AI plays some role include The Matrix, RoboCop, The Terminator, Austin Powers, Star Trek, Star Wars, Wall-E, Spider-Man, The Incredibles and Finch. The Jetsons, an animated television sitcom from the 1960s, showed families living in smart cities with autonomous vehicles that flew on autonomous vehicle highways in the air, neither of which exist yet. However, video calls, robotic vacuum cleaners and drones, which were featured in The Jetsons, are now commonplace.

Test your ethical ChatGPT IQ

1. Discuss your reaction to the quiz. How did you do? What surprised you the most? What did the quiz help you learn?

Student answers will vary. I did not do very well. I really thought that I could recognize chatbot answers, but I was surprised that I was wrong on most questions. I learned that whenever I get information, I have to find out who or what wrote what I found.

2. Based on all that you've learned about ChatGPT, what is the first thing you would ask it? Share with a partner.

Student answers will vary. Given that ChatGPT is known for making mistakes, I would ask ChatGPT to tell me how it will correct its mistakes going forward.

3. Would you consider using ChatGPT to help you with your schoolwork? Explain how and why it would be useful and what implications it could have on how you learn necessary literacy skills, learning techniques or basic foundational content.

Student answers will vary, but they might address ChatGPT's ability to guide their writing or outline their work. Students should note that ChatGPT cannot provide fact-checked answers. I would not use ChatGPT for facts in my homework, because I don't want my answers to be wrong. However, it might be helpful with things like which order to place sentences and how to spell and punctuate. I think it will take a while for ChatGPT to be as useful as other classroom technologies.

4. When Google search, calculators and Chromebooks were introduced to schools, school districts had to make policies about their use. Discuss what policy you think your school should adopt for student use of ChatGPT. Provide sound reasoning for your suggestion.

Student answers will vary. Many students might explain how calculators and Chromebooks are used to further student understanding of concepts or to solve complex problems. Proposed policies might include the following points: ChatGPT will be used to help students formulate ideas for writing and/or organize their thoughts on a topic. If ChatGPT text is ever used verbatim, a proper citation must be used to distinguish ChatGPT text from student work.

5. What ethical issues do you foresee with use of ChatGPT? How might these ethical issues be addressed?

ChatGPT might provide incorrect, biased, insensitive or harmful language, and it also can provide fake citations for its content. Another major ethical concern is how the information output from ChatGPT might be used and who has access to it. ChatGPT is currently open, but who will have access to it if it goes behind a paywall? Users have access to the content, which isn't watermarked in any way. There are not great systems in place to monitor for plagiarism, nor are there policies in place to help guide use. Developers need to check and safeguard against these types of issues and will need help from larger, communities of professionals who specialize in specific types of ethical concerns to prevent and actively monitor for these issues.

April 8, 2023

**Homework Help? ChatGPT is
Poised to Disrupt Education****Student Discussion Worksheet**

Directions: Read "[Let's learn about artificial intelligence](#)" and "[Scientists Say: Machine learning](#)" from *Science News Explores* before discussing the first set of questions. Then read the *Science News Explores* article "[Think twice before using ChatGPT for help with homework](#)" and take the quiz at the end of the article before discussing the prompts in the second section.

Alexa, Explain AI

1. What does AI stand for and what does it do? Why do you think AI got the name that it did?
2. Discuss common uses of AI mentioned in the *Science News Explores* articles. Based on these examples, what areas can you think of where AI is used?
3. Much of today's AI is based on machine learning. Explain how two types of machine learning — supervised learning and reinforcement learning — are different. What do you think "unsupervised learning" means? Hint: It is another kind of machine learning.
4. After analyzing the different types of machine learning, discuss the similarities among the types to explain generally how AI computers learn.
5. Discuss examples of AI in art, movies, books and television shows. Choose an example and talk about how AI was used in the work and note which parts are still science fiction and which parts are now real.

Test your ethical ChatGPT IQ

1. Discuss your reaction to the quiz. How did you do? What surprised you the most? What did the quiz help you learn?

2. Based on all that you've learned about ChatGPT, what is the first thing you would ask it? Share with a partner.

3. Would you consider using ChatGPT to help you with your schoolwork? Explain how and why it would be useful and what implications it could have on how you learn necessary literacy skills, learning techniques or basic foundational content.

4. When Google search, calculators and Chromebooks were introduced to schools, school districts had to make policies about their use. Discuss what policy you think your school should adopt for student use of ChatGPT. Provide sound reasoning for your suggestion.

5. What ethical issues do you foresee with the use of ChatGPT? How might these ethical issues be addressed?

