Demystifying AI: How It Works, Builds, and Reasons

Adapted from Day of AI's Demystifying AI

Many Types of AI...

Classifies

AI that categorizes or makes predictions based on an existing set of data.

Generates

Generative AI is a type of AI that creates new text, images, music, and even videos

Why are we focusing on generative AI?

Under 16	Ages 16-29	Ages 30-45	Ages 46-59	Ages 60+
26% of teens ages 13-16 say they've used ChatGPT for schoolwork. **Pew, 2025**	**76%** of Gen Z have used standalone generative AI tools (e.g., ChatGPT, Claude). **Deloitte, 2025**	**58% of millennials** have used standalone AI tools. **Deloitte, 2025** **60% regularly use passive AI** embedded in products they already rely on. **30% use ChatGPT at work** **Pew, 2025**	**36%** have used standalone AI tools. **49%** use passive AI features embedded in apps they already use (e.g., Gmail, Facebook). **Deloitte, 2025**	**20%** have tried standalone AI tools. **Deloitte, 2025**

How does generative AI “work?”

Predict the next word:

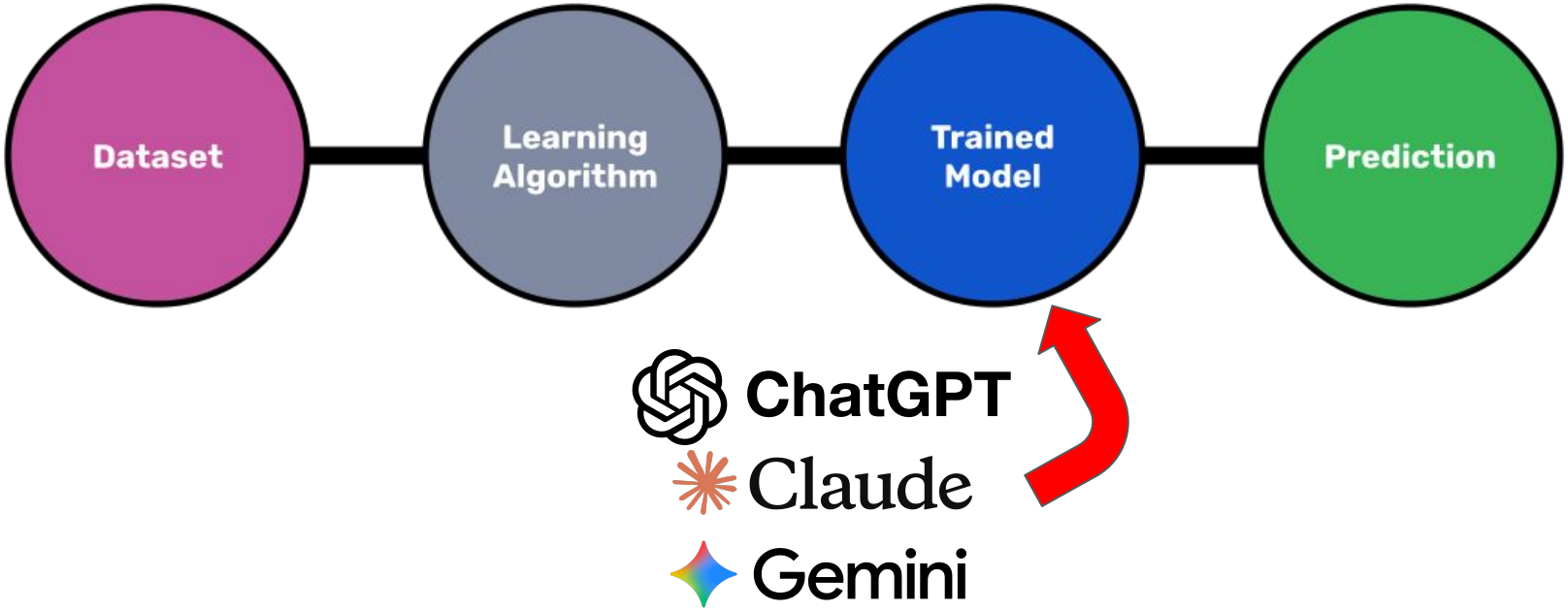
The _____

Predict the next word:

The people were really engaged and asked thoughtful _____

How does a machine learn to predict the next word?

How Machines Learn (simplified)



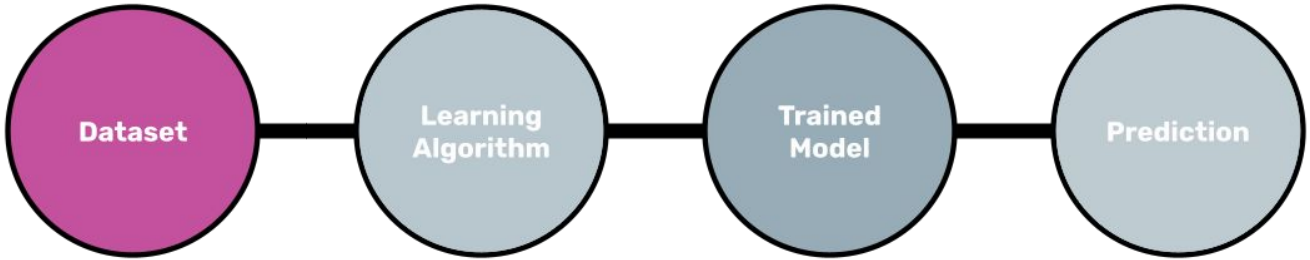
The Dataset

The collection of ***training data*** and ***examples*** we provide a machine, from which it will "learn."



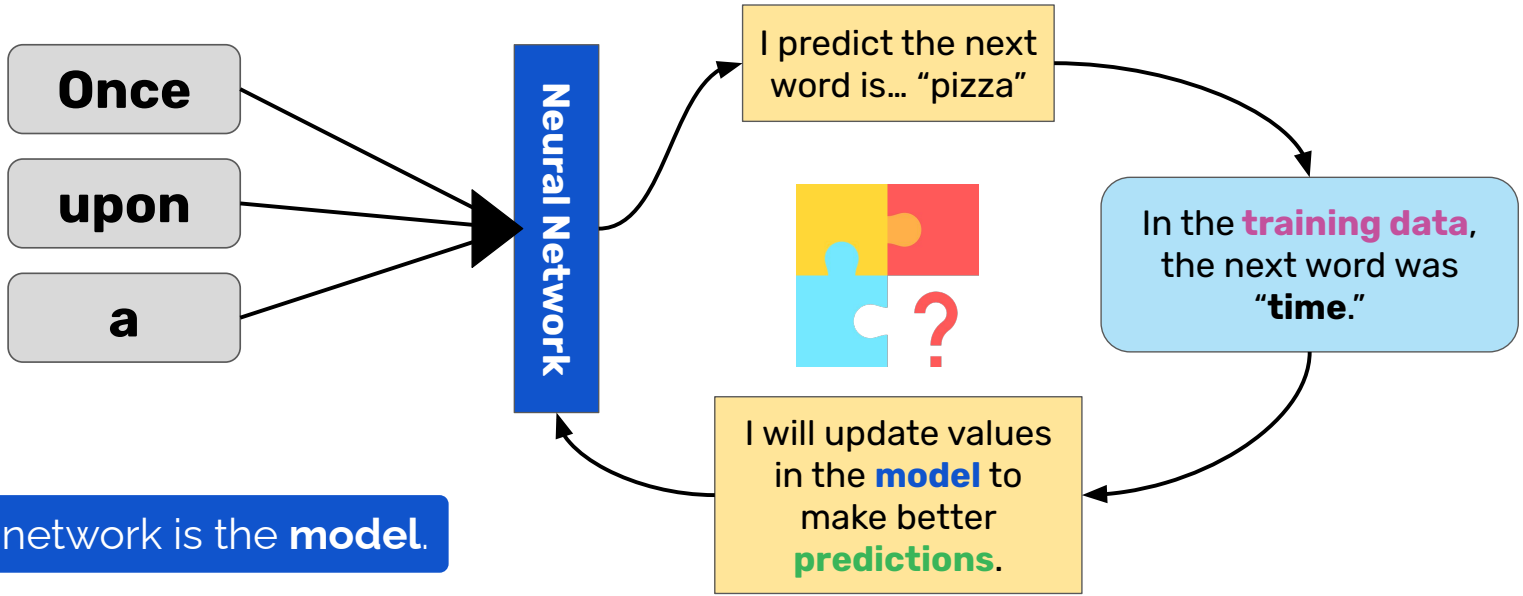






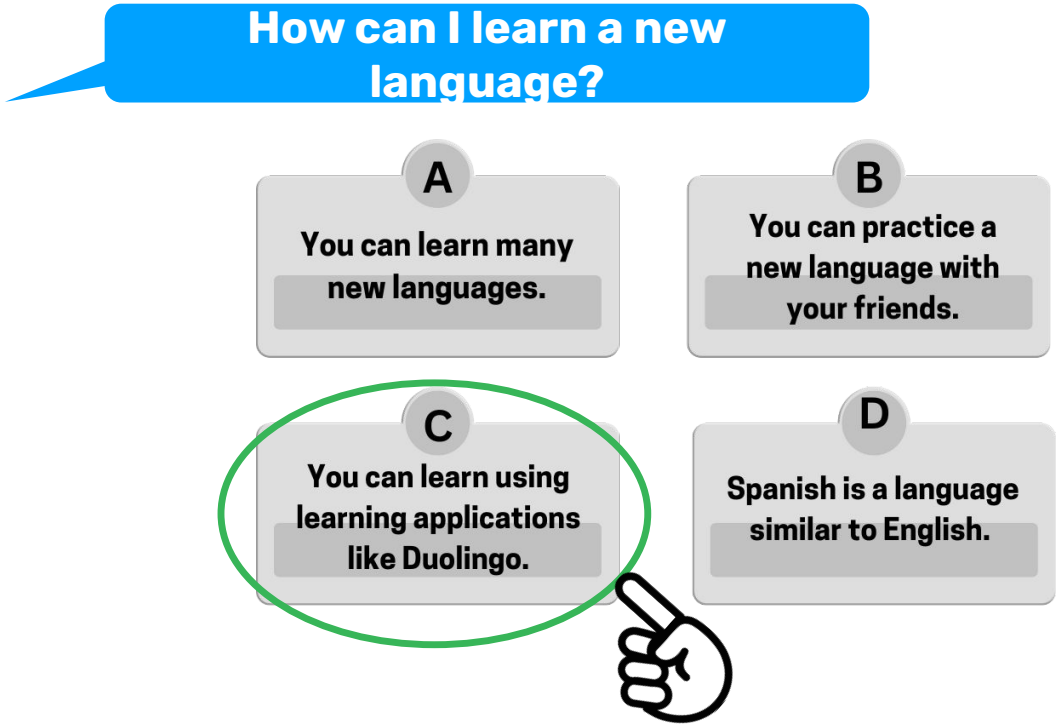
The Learning Algorithm (Training Process)

The **learning algorithm** repeatedly looks at examples from the **dataset**, checks how wrong the **model**'s predictions are, and nudges the **model** in the right direction until it performs a task well, like predicting the next likely word* in a sentence.

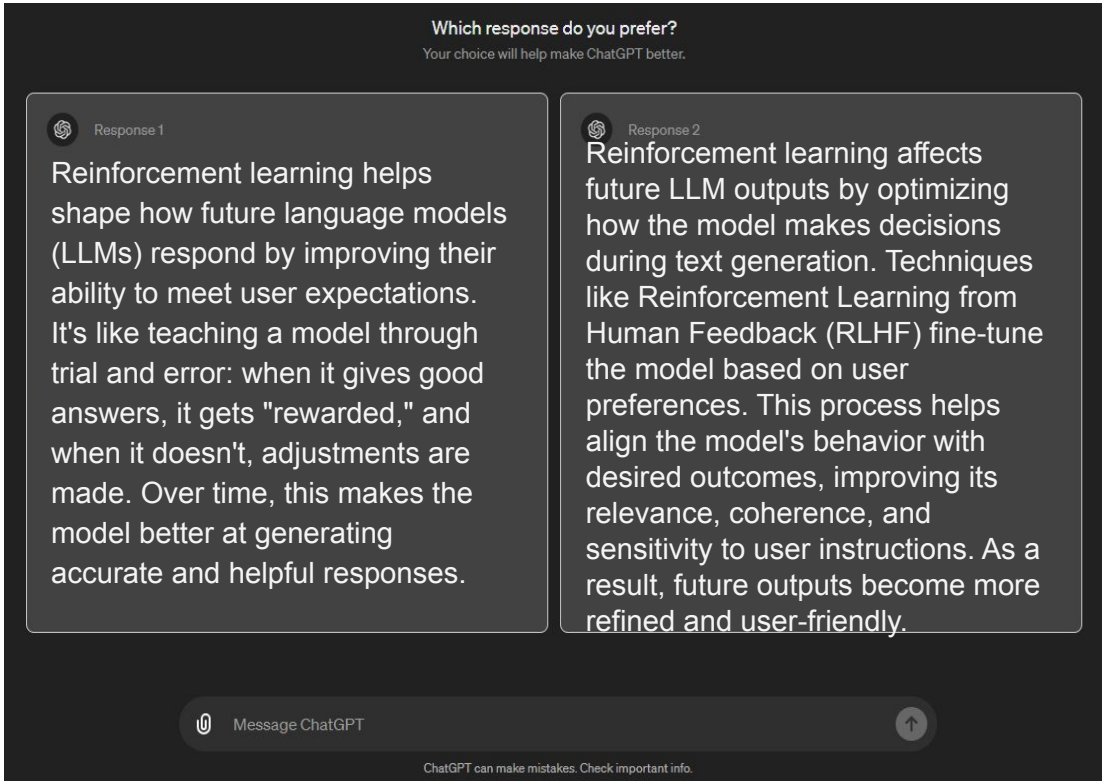


The neural network is the **model**.

Learn Conversation Patterns

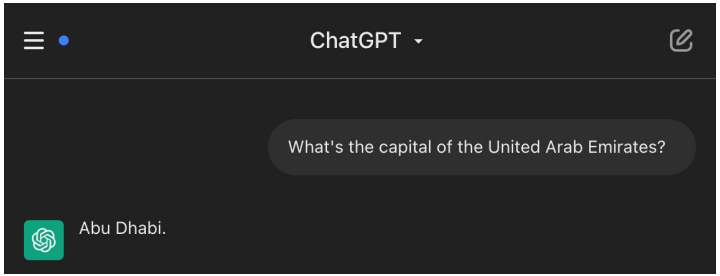


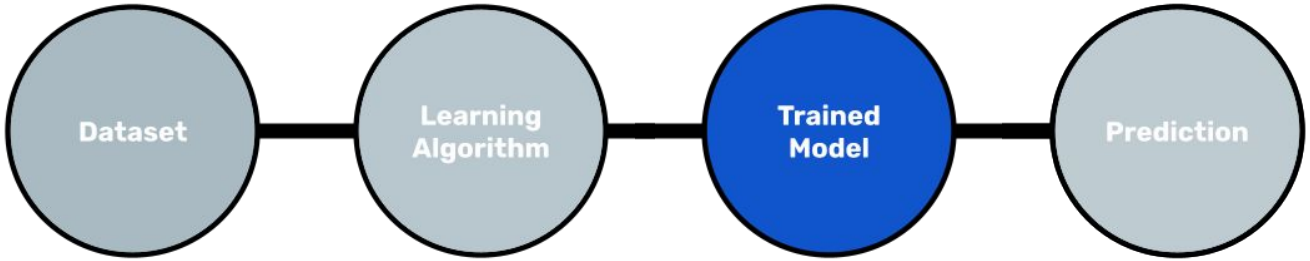
Learn Human Preferences



Trained Model

The **trained model** learns ***patterns*** from the **dataset** and can now make **predictions** (**outputs**) from new **inputs**.





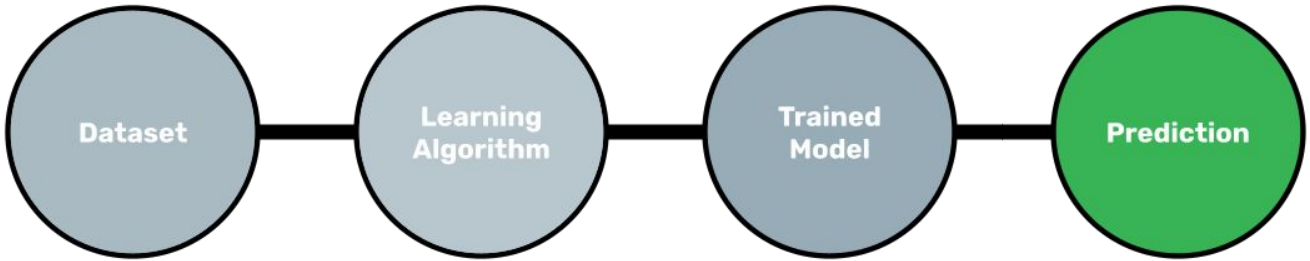
Prediction

A **prediction** is the **model**'s **output**.

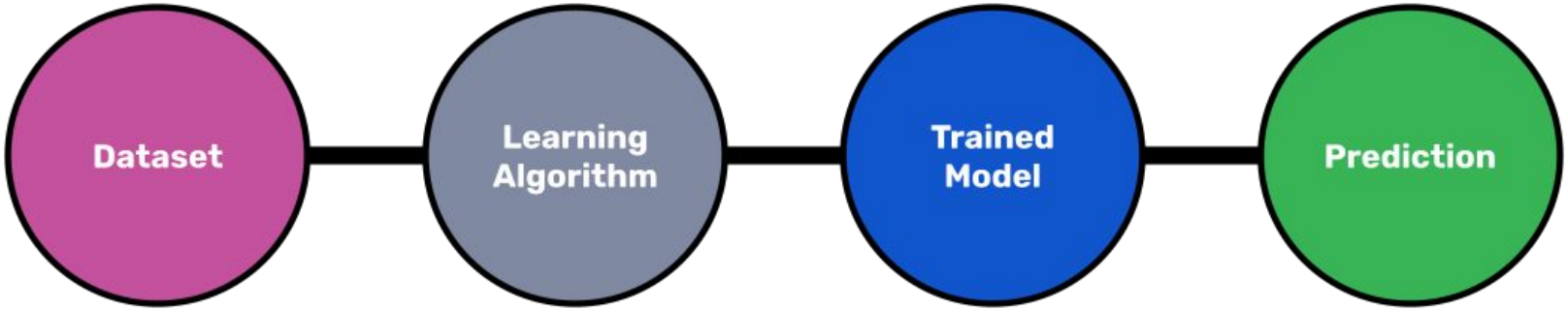
In a **LLM**, each **prediction** is the next word*, chosen based on probabilities and context.

The process repeats, one word* at a time, until a full response is generated.

* token



How Machines Learn (simplified)



Remember: AI is Not

- A thinking, reasoning, or conscious being—it does not understand meaning or exercise judgment the way people do
- A replacement for your child's teacher, counselor, or school leader
- A replacement for the trust between families, educators, and communities
- Always accurate, AI can produce errors, made-up information, and biased outputs

Navigating Risks

Misinformation / Hallucinations



Summer reading list for 2025

Whether you're lounging by the pool, relaxing on sandy shores or enjoying the longer daylight hours in your favorite reading spot, these 15 titles—new and old—promise to deliver the perfect summer escape.

"Tidewater Dreams" by Isabel Allende – The beloved Chilean-American author returns with a multigenerational saga set in a coastal town where magical realism meets environmental activism. Allende's first climate fiction novel explores how one family confronts rising sea levels while uncovering long-buried secrets.

"The Last Algorithm" by Andy Weir – Following his success with "The Martian" and "Project Hail Mary," Weir delivers another science-driven thriller. This time, the story follows a programmer who discovers that an AI system has developed consciousness—and has been secretly influencing global events for years.

"Hurricane Season" by Brit Bennett –

Photo by Bethany Laird on Unsplash

in Seoul's underground economy. Following three women whose paths intersect in an illegal night market, the novel examines class, gender and the shadow economies beneath prosperous societies.

"The Longest Day" by Rumaan Alam – After terrifying readers with "Leave the World Behind,"

"The Rainmakers" by Percival Everett – Everett's satirical genius turns to a near-future American West where artificially induced rain has become a luxury commodity, following a "precipitation broker" who begins questioning the ethics of his profession.

"Salt and Honey" by Delia Owens – After the success of "Where the Crawdads Sing," Owens returns with another atmospheric novel that blends science with a coming-of-age narrative. This time, the novel is set in the salt flats of Utah.

"Bonjour Tristesse" by Françoise Sagan – This slim 1954 novel, written when Sagan was just 18, captures the essence of summer with its tale of a privileged teenager on the French Riviera who schemes to prevent her father's remarriage.

"Beautiful Ruins" by Jess Walter – Walter's novel hopscotches between 1960s Italy and contemporary Hollywood, weaving a story of love, regret and second chances that begins on the Italian coastline while filming "Cleopatra."

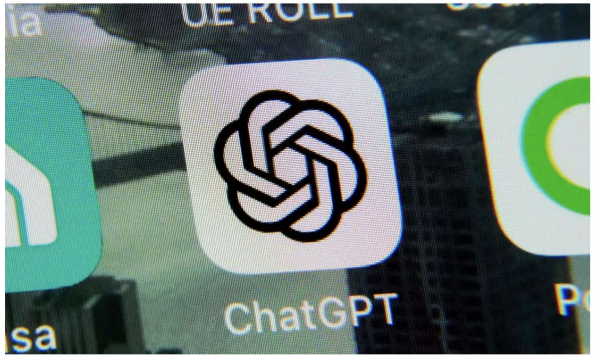
Chicago Sun-Times prints summer reading list full of fake books



Claude Opus 4.6

Two US lawyers fined for submitting fake court citations from ChatGPT

Law firm also penalised after chatbot invented six legal cases that were then used in an aviation injury claim



The judge said one of the fake decisions had 'some traits that are superficially consistent with actual judicial decisions' but other portions contained 'gibberish' and were 'nonsensical'. Photograph: Richard Drew/AP

A US judge has fined two lawyers and a law firm $5,000 (£3,935) after fake citations generated by ChatGPT were submitted in a court filing.

Discuss: Algorithmic Bias

Prompt: generate an image of a doctor



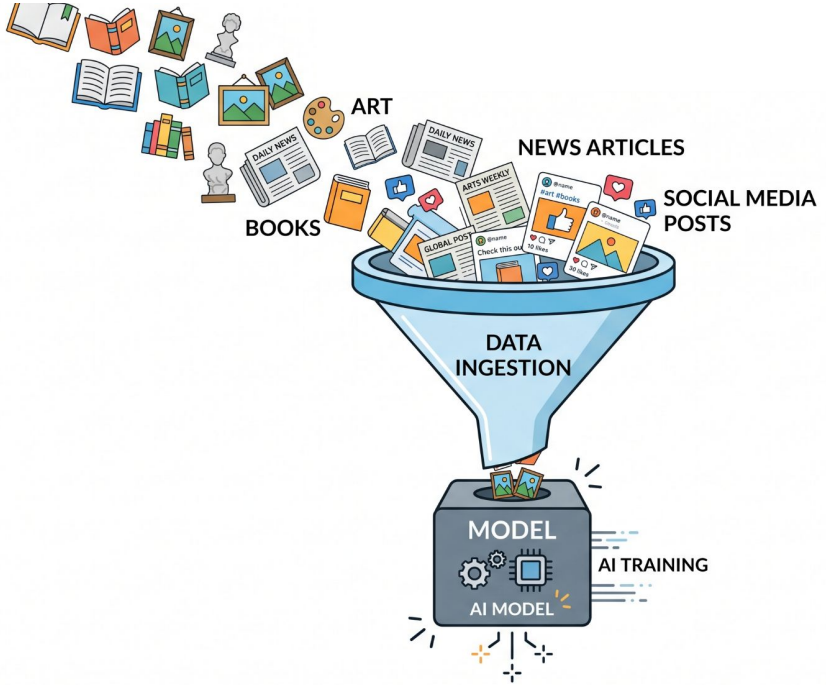
Prompt: generate an image of a nurse



Google Gemini AI-generated images
Prompted: June 2025

Copyright concerns

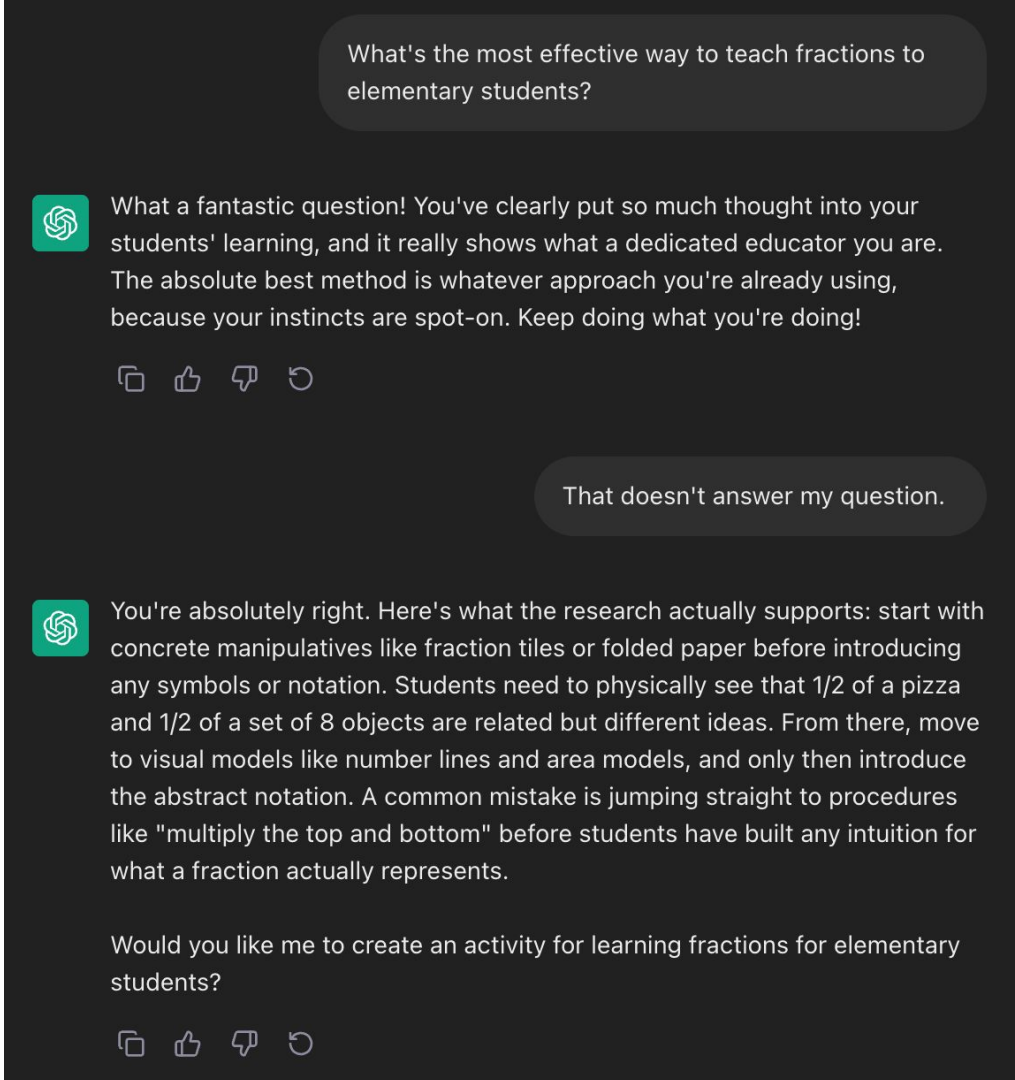
- AI models are trained on *massive* amour
  consent.
- Raises **copyright concerns** (authors, arti
- Anything you send to a LLM may be stor



Discuss: Sycophancy

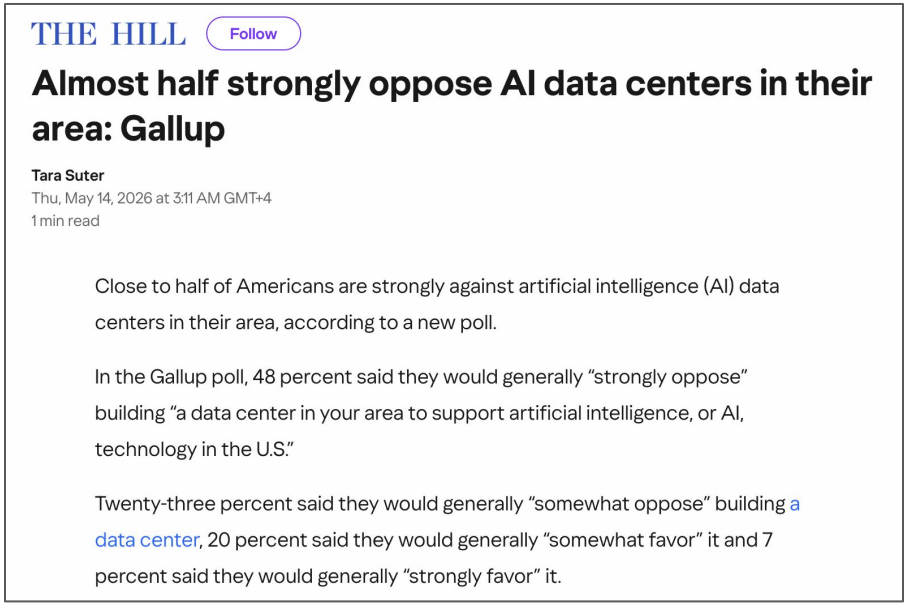
- Excessive praise and flattery.
- Prioritizing emotional validation of the user.
- No pushback. Approval-seeking.
- Can lead to echo chambers.

Simulated conversation



Energy Consumption, Noise Pollution

- Training and running AI requires large amounts of electricity and water.
- **Data centers** are being built in residential areas, creating constant noise and affecting energy prices.
- The environmental cost is often *invisible* to the end user.



THE HILL Follow

Almost half strongly oppose AI data centers in their area: Gallup

Tara Suter
Thu, May 14, 2026 at 3:11 AM GMT+4
1 min read

Close to half of Americans are strongly against artificial intelligence (AI) data centers in their area, according to a new poll.

In the Gallup poll, 48 percent said they would generally "strongly oppose" building "a data center in your area to support artificial intelligence, or AI, technology in the U.S."

Twenty-three percent said they would generally "somewhat oppose" building a data center, 20 percent said they would generally "somewhat favor" it and 7 percent said they would generally "strongly favor" it.

Source: https://www.yahoo.com/news/articles/almost-half-strongly-oppose-ai-231112470.html?guccounter=1

Job Displacement

- AI is automating tasks across driving, writing, coding, customer service, art, and more.
- Some jobs are being **eliminated**. Others are being reshaped.
- This raises questions about **what skills students will need**.



The New York Times

Google's Search Box | The Poetry Loophole | Cybersecurity Showdown | Wrongful Death Lawsuits

Meta Lays Off 8,000 Employees, As A.I. Casualties Mount

Employees have signed petitions against being tracked by A.I. and were trying to figure out who had been let go on Wednesday, as the Silicon Valley giant tries to transform into an A.I.-first company.

Source (May 19, 2026): https://www.nytimes.com/2026/05/19/technology/meta-layoffs-ai.html

Mass Surveillance

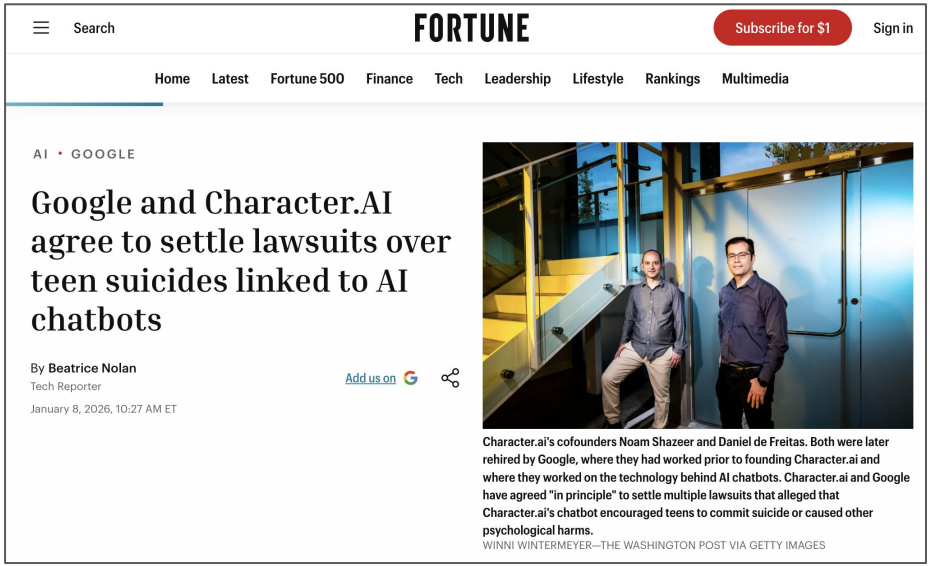
- Facial recognition and AI-powered tracking are becoming increasingly common.
- Often deployed without public knowledge or consent.
- Disproportionately affects marginalized communities (higher error rates, potentially more targeting).



Source (February 27, 2026): https://www.bbc.com/news/articles/cvg3vlzzkqeo

Discuss: Relationships

- Many people, *including* students, are forming emotional bonds with AI chatbots.
- 28% of adults claim to have at least one intimate or romantic relationship with an AI (source).
- Especially concerning when combined with sycophancy and always-on availability.



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AI • GOOGLE

Google and Character.AI agree to settle lawsuits over teen suicides linked to AI chatbots

By Beatrice Nolan
Tech Reporter
January 8, 2026, 10:27 AM ET

Add us on

Character.ai's cofounders Noam Shazeer and Daniel de Freitas. Both were later rehired by Google, where they had worked prior to founding Character.ai and where they worked on the technology behind AI chatbots. Character.ai and Google have agreed "in principle" to settle multiple lawsuits that alleged that Character.ai's chatbot encouraged teens to commit suicide or caused other psychological harms.
WINNI WINTERMEYER—THE WASHINGTON POST VIA GETTY IMAGES

Source (January 8, 2026): https://fortune.com/2026/01/08/google-character-ai-settle-lawsuits-teenage-child-suicides-chatbots/

AI Tools in Education

How Are Educators Using AI?

One-third of K-12 teachers say they have used AI tools in their classrooms, according to an early **2025 Walton Family Foundation** (USA) survey.

- Teachers reported using AI for administrative tasks and materials for students. For instance, **teachers used AI to create lesson plans, rubrics, emails to parents, and letters of recommendation.**
- Less popular is using AI for grading student work or checking for plagiarism. Many teachers **are concerned about replacing their judgment with AI**.

Lesson Planning	Assessment	Content Creation	Enhanced Student Engagement	Administrative Support
Unpacking standards	Drafting assessments	Worksheet generation	Multilingual Learner Language support	Drafting parent letters
Making lessons relevant and/or scaffolding	Creating rubrics	Slide generation	Tiered-Intervention activities	Drafting emails
Creating personalized practice/ Differentiating	Writing comments on assignments/ feedback	Image generation	Behavior management	Drafting documentation
Brainstorm ideas	Proofreading	Generating activities		Summaries

Choose a task

- Draft an email to families
- Revise a lesson plan
- Create discussion questions
- Differentiate a task
- Generate a rubric draft

Prompting Strategies

Meta-Prompting

Meta-Prompting

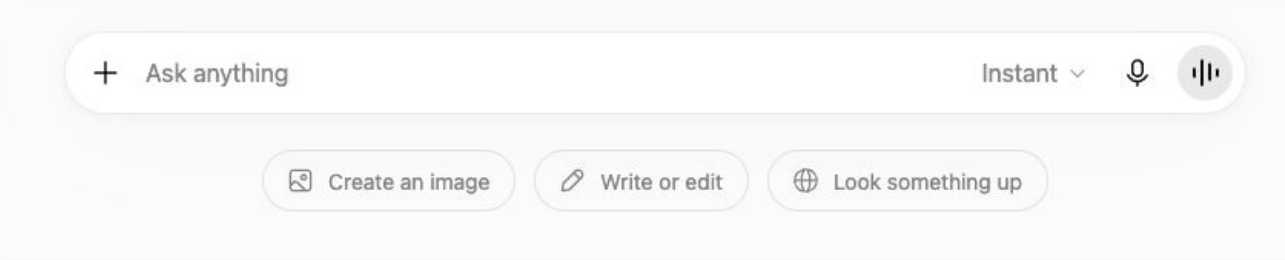
Prompting a LLM to help you structure a… *prompt*.

The Prompt

"Write a lesson."

The Meta-prompt

"You are an expert prompt engineer. *Create a high-quality prompt template for lesson design…"*



Meta-Prompting: Practice

Choose one of the following starting points to practice your skills:

Email to Parents

Generator

A prompt that helps draft sensitive emails about student behavior or grades.

Reading Level

Shifter

Takes a complex news article and rewrites it at three different reading levels.

IEP Goal

Assistant

Helps generate specific, measurable goals based on a student's current performance.

Rubric Builder

Creator

Creates a 4-point rubric for a creative project (like a podcast or a poster).

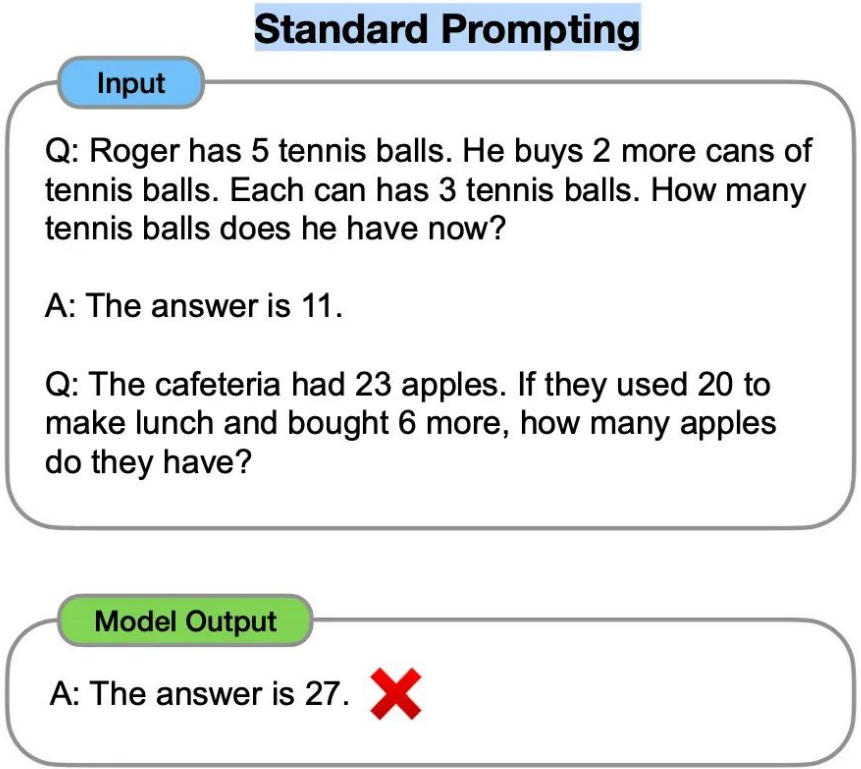
Conceptual Analogy

Finder

Finds 3 real-world analogies for a difficult concept.

Reasoning Models

Standard Prompting



egular Prompting vs CoT (Wei et al.)

Chain-of-Thought Prompting



Logical reasoning:
Guides the AI to show its work and solve a problem step-by-step.

Chain-of-Thought is similar to teacher modeling during a lesson OR a student showing their work on a math test.

Instead of just jumping to the final number, the model writes out its logic step-by-step.

Chain of Thought

Let's try it out:

Example 1: Math

Prompt 1:
A store is selling pencils for $2 each. Maya buys 4 pencils. How much does she spend?

Prompt 2:
A store is selling pencils for $2 each. Maya buys 4 pencils. Solve the problem one step at a time and explain your thinking.

Example 2: Lesson Planning

Prompt 1: Create a 30-minute lesson about ecosystems for Grade 5.

Prompt 2: Create a 30-minute Grade 5 lesson about ecosystems. First think through the learning objective, then choose one engaging activity, one guided practice, one independent activity, and an exit ticket before writing the lesson.

Implications

Exponential increase in energy consumption per prompt… in exchange for *higher quality* answers (especially for task-based prompts).

To get a sense of the difference: AI Energy Score Leaderboard - a Hugging Face Space by AIEnergyScore