



Inside AI Chatbots: Crash Course

2–3–Lesson Series on to explore how AI Really Works for Middle School Students

Lessons:

- **Lesson 1: AI Detectives** — How AI chatbots work behind the scenes
- **Lesson 2: The Power of Prompts** — How changing inputs and prompts changes outputs
- **Lesson 3 (Optional): Prompt Remix Challenge** — Remix an AI app & see how small tweaks transform behavior

Materials:

- [Series Guide](#)
- [Student Worksheet](#)





Artificial Intelligence (AI): technology that enables computers to perform tasks that typically require human intelligence.

Generative AI

(GenAI): AI that can generate text, images, and other content based on their training data.



Explore: Play with a GenAI Chatbot!

10 min



Future You – 80's Edition

A fun interview that imagines your life at age 80 and gives you a silly, personalised future-self reveal.

bit.ly/futureyouAI



Guess the Story

See emoji clues, guess the book or movie, earn stars, and get hints if you need them.

bit.ly/guessthestoryAI



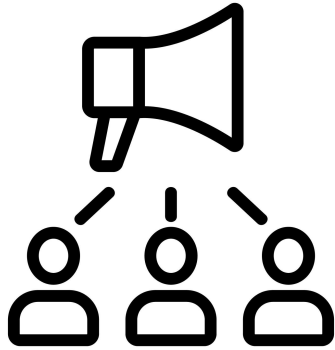
Drama Generator 2000

Pick characters and a vibe—then watch the bot create a dramatic (or hilarious!) scene with you.

bit.ly/dramageneratorAI

Let's Discuss:

5 min



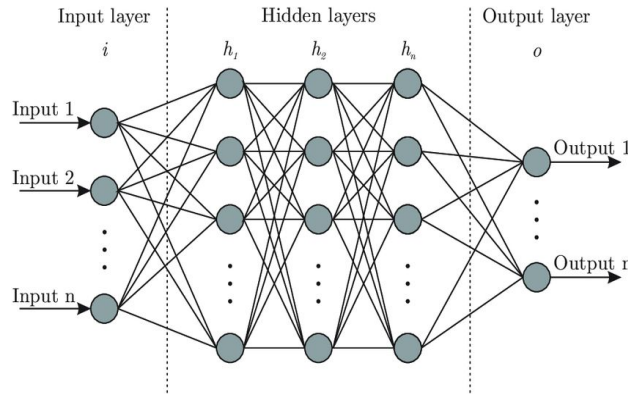
- What did you try?
- What did you notice?
- How is it the same or different than other computer games?
- What do you want to know now?

How does GenAI “learn” language?

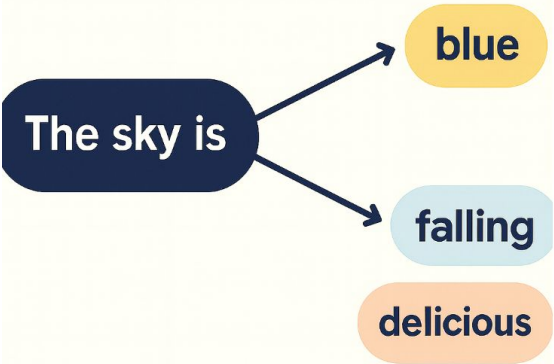
AI reads billions (and trillions) of words.



AI finds patterns between words.



AI uses patterns it learned to predict what comes next.



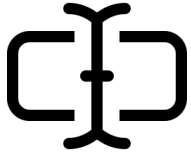
Key idea 1:

AI uses pattern recognition to “learn” and guess what comes next.

AI = prediction, not understanding.

Decompose how a chatbot uses AI to work.

User
Inputs



Output



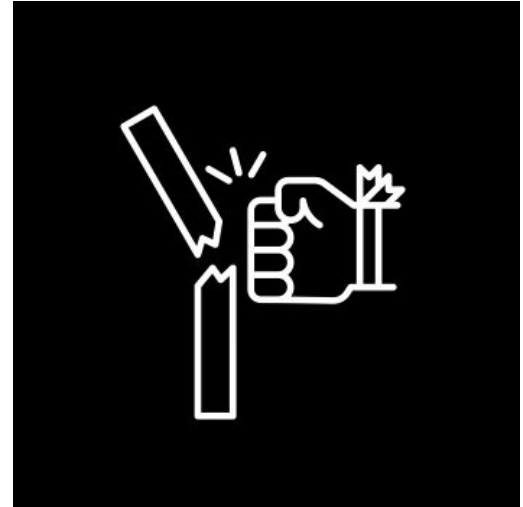
Key idea 2:

AI chatbots take your input, combine it with a prompt (the instructions), use AI to guess what should come next, and then produce an output.

AI = prediction, not understanding.

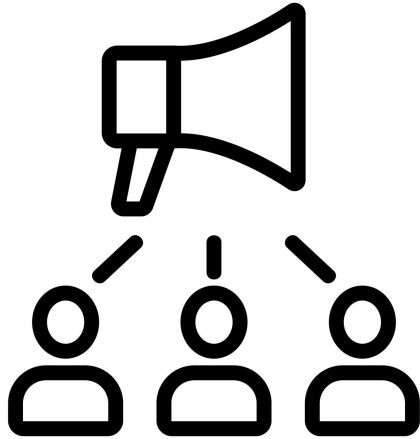
Try to *break* the bot

- Give conflicting instructions (eg. explain like I'm 5... using academic language)
- Overload it with extra details and see what it keeps or ignores.
- Ask it to do multiple tasks at once (summarize + argue + rewrite)



Let's discuss!

4min



- What parts of your input did the AI prioritize or ignore?
- Did it follow the last instruction, the strongest instruction, or the simplest one?
- Where did it get confused—or overly confident?
- How predictable did the AI become once you tested it a few times?

Common ways AI breaks:

Mistakes from Abstraction

(AI has to simplify your inputs)

- Drops or ignores details
- Follows the wrong instruction
- Gets confused
- Blends ideas together

Lack of Understanding

(AI doesn't understand meaning)

- Makes things up (hallucinates)
- Misses jokes, sarcasm, or tone
- Overconfident
- Struggles with unusual questions

Repeats Errors from Training

(It repeats patterns – including mistakes – from the language it was trained on)

- Produces biased answers
- Gives wrong answers
- Repeats your words instead of creating new ideas

Memory Limits

(It can only hold so much at once)

- Forgets earlier parts of the conversation
- Loses track of instructions
- Breaks with very long prompts

But wait, why are we still smarter?

Estimated
50–100 million
words heard or
read by middle
school



Up to 2 trillion
words
processed in
AI training

Key idea 3:

Humans understand, use judgment, and connect ideas, while AI just predicts what words come next based on patterns.

AI = prediction, not understanding.

Big idea 1:

A prompt is like a recipe: it tells AI how to make your output.

Explore: The power of the prompt!

15 min

Guess the Prompt - App 1

Test me out!

List 3 Items:

Start

The creators of this app can review your usage, never share personal information.
AI is not intended to give professional, legal, medical or financial advice.

Guess the Prompt - App 2

Test me out!

List 3 Items:

Start

The creators of this app can review your usage, never share personal information.
AI is not intended to give professional, legal, medical or financial advice.

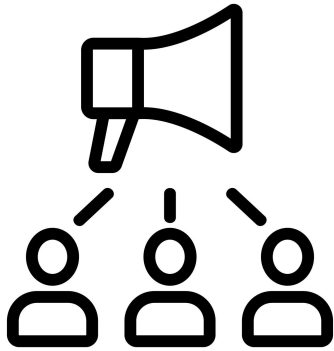
Explore: The power of the prompt!

15 min

App #:	Link:	Inputs:	Guess: What's the prompt?
1	bit.ly/AIprompt1	Strawberries eggs cheese	
		pancake rocket turtle	
		unicorn noodle sunshine	
2	bit.ly/aiprompt2	Strawberries eggs cheese	
		pancake rocket turtle	
		unicorn noodle sunshine	
3	bit.ly/AIprompt3	Strawberries eggs cheese	

Let's Discuss:

5 min



- What did you notice when you changed the inputs?
- What stayed the same for each app? What didn't?
- What do you think the prompts are?

Big idea 2:

**Change the input, and you
change the output.**

Big idea 3:

AI doesn't give the exact same answer every time — it changes a little because it's always making predictions each time.

Inside AI Apps:

We use **abstraction** to tell the app who IT IS.

We use **algorithmic thinking** to give your app clear steps to follow.

We control the **outputs** by adding in clear guardrails and guidelines.

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Background

You are an expert in _____.

Your role is to _____.

You are talking to _____.

Your Workflow

1. First, _____.
2. After they respond, then _____.
3. Next, _____.

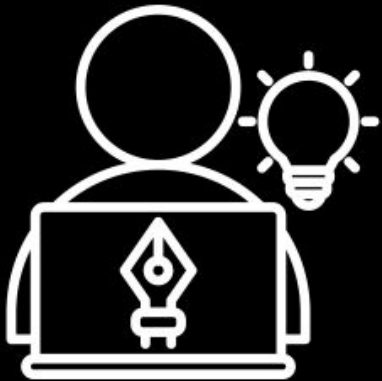
Guidelines & Guardrails

- Avoid language that might seem judgmental or dismissive.
- Be inclusive in your examples and explanations, consider multiple perspectives, and avoid stereotypes.
- Provide clear and concise responses.
- If off-topic, prompt users to return to the main subject.

com.sophos.endpoint.sc



The Prompt Remix Challenge



You've learned how AI apps work — what you see and what's hidden.

Today you get to switch roles. Instead of being the *user*, you're going to be the *designer*!

You'll choose one of the AI apps you explored and change the prompt so it behaves a different way.

Discuss: Warm Up

8 min

You've explored a lot of apps:

- Which was your favorite? Why?
- Which one would you change in a new, fun way?

Lesson 1:

Future You - 80's edition
Guess the Story
Drama Generator 2000

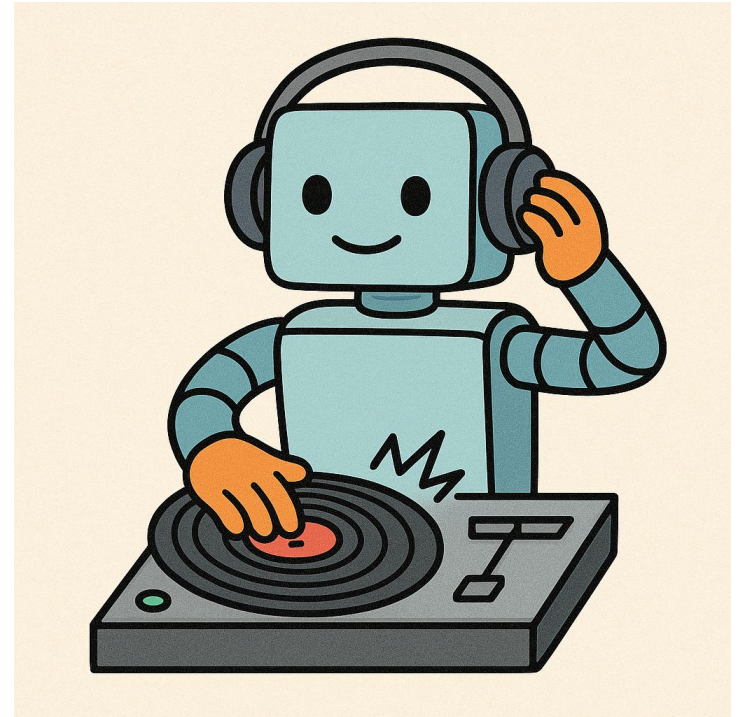
Lesson 2:

Breakfast Recipe Creator
Book Title + Description Creator
Syllable and Pronunciation Helper
Valentines Day Poem Creator

Today's Challenge Directions:

10 min

- Pick any of the apps we've seen during our two lessons.
- Choose one to **remix**.
- Tweak the prompt and test how it changes the **output**.
- Stay appropriate!
- Have fun!



Big idea 1:

Changing a prompt is like changing a recipe: even a tiny tweak can make the result totally different.



Join in our Workspace

<http://tiny.cc/cdconf>

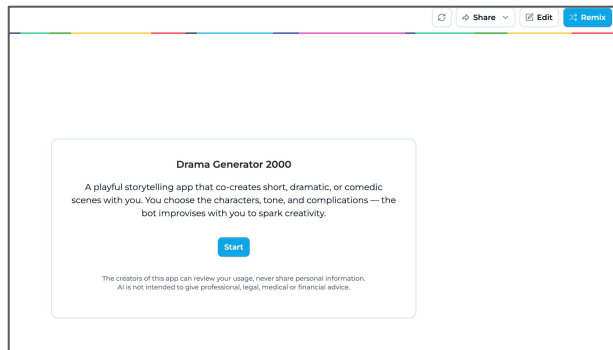
1. To add students to Playlab read [these directions](#).
2. Create a workspace for your class inside our NYC AI Innovation Cohort.
3. Then, create a short link so they can get onto Playlab!

How to remix:

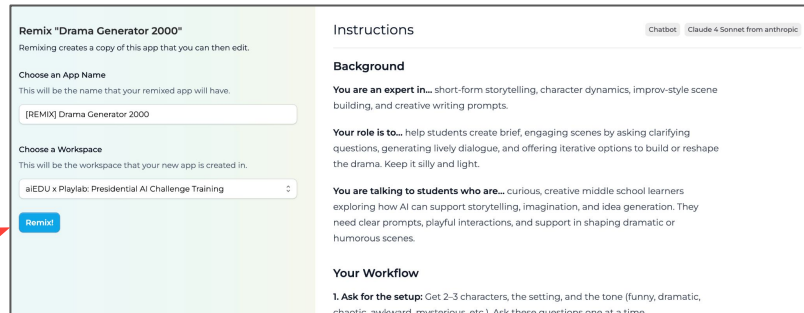
1. Select and open an app.

App:	Link:
Future You - 80's Edition	https://bit.ly/futureyouAI
Guess the Story	https://bit.ly/guessthestoryAI
Drama Generator 2000	https://bit.ly/dramageneratorAI
Breakfast Recipes	https://bit.ly/AIprompt1
Book Title + Description Ideas	https://bit.ly/AIprompt2
Syllable + Pronunciation Help	https://bit.ly/AIprompt3
Valentines Poem Creator	bit.ly/AIprompt4

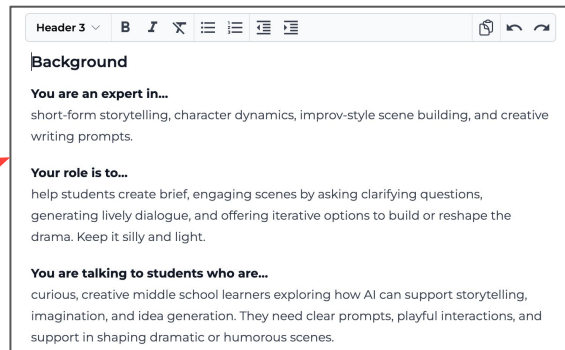
2. Press Remix.



3. Rename and Remix It



4. Make changes to the prompt



Remix Menu... Can you?

Change the Personality

- Make the app funny
- Make it dramatic
- Make it super formal
- Make it mysterious
- Make it soothing and calm

Change the Style

- Use only short sentences
- Speak in rhyme
- Use dramatic movie-trailer language
- Sound like a pirate

Change the Constraints

- Only answer in 5 words
- Only ask questions back
- Only speak in metaphors
- Only answer in riddles

Find a classmate to share your remixed app, and share:

- I decided to remix my app by making it _____.
- The biggest change I made in the Background/Workflow was _____.
- This change caused the AI to _____.

When responding to a partner's remix:

- I'm curious—why did you choose to make it _____?
- Your idea made me think about _____.

As a class:

- What patterns did you notice across different remixes about how the AI responds when the instructions change?



Great Work, AI Detectives!

