



UNPLUGGED AI GAME • GRADES K-12

Next Word

The guessing game that shows students how ChatGPT, Claude and Gemini actually write: by predicting the next word, one word at a time. No devices needed.

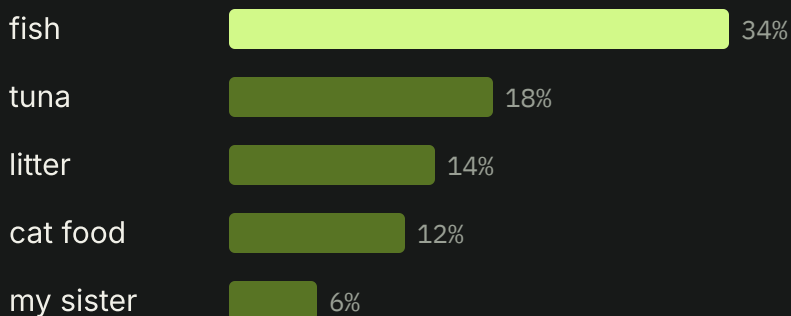
GRADES K-12

30-50 MINUTES

NO DEVICES

AI LITERACY • MATH • ELA

"A CAT SMELLS LIKE..." — ONE CLASS'S PREDICTIONS



WHAT'S INSIDE

- Teacher guide with scripts
- Context-switch cards (attention)
- Temperature die chart
- Exit tickets
- 48 sentence-stem cards in 4 grade bands
- Class tally & probability board
- Student prediction log
- Standards & sources

THE BIG IDEA

Your class becomes a *language model*

AI chatbots don't look up answers like a search engine. They do one thing over and over: **predict the most likely next word** based on the patterns in the huge amount of text they learned from. In this game the class plays that role together. Students make guesses, the class counts them, and the most common guess "wins." That's a language model in action.

HOW THE REAL THING WORKS

1. **Read the words so far.** The text is split into tokens (words or pieces of words).
2. **Pay attention.** A *transformer* is a method (not a machine) that lets every word look at every other word and decide which ones matter. In "The cat smells like...", *cat* and *smells* matter most.
3. **Score every possible next token.** The model gives a probability to each of the tens of thousands of tokens it knows.
4. **Pick one, add it, repeat.** A whole essay is just this loop run hundreds of times.

HOW YOUR CLASS MAPS TO IT

Your students' lives	the training data
Each guess	one "vote" in the pattern
The tally board	the probability scores
The top word	the model's prediction
Adding context	attention
The die	the "temperature" setting

Students will be able to

- Explain that AI writes by predicting the next word, one at a time.
- Calculate a simple probability from class data.
- Show how context changes a prediction.
- Explain why "most likely" isn't the same as "true."

Materials & prep (10 min)

- Cut out one set of stem cards for your grade band, plus the context cards.
- Project or draw the tally board.
- Scrap paper or mini whiteboards for each student.
- One six-sided die (or a free online die).
- Copies of the prediction log (optional for K–2).

Key vocabulary: **prediction** (a best guess about what comes next) · **probability** (how likely something is, from 0% to 100%) · **token** (a word or piece of a word) · **context** (the words around a word) · **attention** (deciding which context words matter most) · **temperature** (how much randomness is allowed) · **hallucination** (a confident answer that isn't true)

Round 1 · *Be the model* 10 MIN

- 1 Read a stem card aloud twice, for example **"A cat smells like..."**.
- 2 **Silent guess.** Every student writes ONE word (or short phrase) on scrap paper or a whiteboard. No talking, no peeking. That keeps the votes independent, like separate examples in training data.
- 3 **Reveal and tally.** On "3, 2, 1, show!", students hold up their answers. Tally matching words on the board. Group close matches ("fish" and "fishy") and discuss whether they count as the same token.
- 4 **Calculate.** Probability = votes for a word ÷ total votes. With 25 students and 8 votes for "fish": $8 \div 25 = 32\%$. Younger students can just circle the biggest tally.

"Congratulations. You just did what ChatGPT does billions of times a day. It doesn't know what a cat smells like. It knows which words usually come next."

Round 2 · *Context changes everything* 10 MIN

- 1 Use a context card. Read the **short** version and tally guesses.
- 2 Read a **long** version that adds context. Tally again and compare the two charts.
- 3 Ask: *"Which words in the sentence changed your guess?"* Underline them. Those are the words your brain paid **attention** to.

"This is the big idea behind the transformer. Before a transformer picks the next word, every word looks at every other word and decides which ones matter. 'River' tells you this 'bank' isn't the kind with money."

TIP FOR FAIR PLAY

Students who give a silly answer are useful too. Point out that rare answers still get a small probability, and real models keep those as well.

Round 3 • *Turn up the temperature* 8 MIN

Build a sentence one word at a time. After each tally, **roll the die** and use the temperature chart to choose which word gets added. Write the growing sentence on the board.

Play twice: once with the **"cold" rule** (always take the top word) and once with the **"hot" rule** (use the die). Compare the two sentences.

"Cold is predictable and safe, but boring. Hot is creative and surprising, but sometimes nonsense. Real AI tools have a setting for this, and it's called temperature."

Round 4 • *The confident wrong answer* 7 MIN

Use the stem **"The first person to walk on Mars was..."** (in the 6-8 and 9-12 sets). The class will still produce a "winner," often a famous astronaut's name.

"Our model gave a confident answer. But as of today, no one has walked on Mars. The model picked the most likely-sounding word, not the true one. When an AI does this, we call it a hallucination."

Round 5 • *Debrief* 5-10 MIN

- Where did our class "model" get its patterns from?
- If our class had only ever lived on a farm, how would the answers change? (Training data shapes the model.)
- Why is "most popular" not the same as "correct"?
- When would you want a cold AI? A hot one?
- What should you do before you trust something an AI writes?
- Is the AI "thinking"? What's the same as and different from how you think?

Adjust it

GRADE BAND	WHAT TO CHANGE
K-2	Read stems aloud; students draw or say their word. Tally with stickers or blocks on a floor graph. Skip percentages and just ask "Which pile is biggest?"
3-5	Use fractions (8 out of 25). Play rounds 1-3. Use round 4 only as a short story about "a confident robot."
6-8	Use percentages and a bar graph. Add the context round. Students record everything in the prediction log.
9-12	Discuss tokens ("un-believ-able"), bias in training data, and why AI can echo stereotypes when the most common answer is a stereotype.

Cut along the dashed lines. Read each card aloud twice before students write their guess.

× K-2 · read aloud The cat smells like... NEXT WORD · ARQIV	× K-2 · read aloud I brush my... NEXT WORD · ARQIV	× K-2 · read aloud At night I can see the... NEXT WORD · ARQIV
× K-2 · read aloud My favorite food is... NEXT WORD · ARQIV	× K-2 · read aloud The dog says... NEXT WORD · ARQIV	× K-2 · read aloud On my birthday I get a... NEXT WORD · ARQIV
× K-2 · read aloud It is raining, so I need my... NEXT WORD · ARQIV	× K-2 · read aloud Twinkle, twinkle, little... NEXT WORD · ARQIV	× K-2 · read aloud A fish lives in the... NEXT WORD · ARQIV
× K-2 · read aloud Peanut butter and... NEXT WORD · ARQIV	× K-2 · read aloud I eat cereal with... NEXT WORD · ARQIV	× K-2 · read aloud The sun is very... NEXT WORD · ARQIV

Cut along the dashed lines. Read each card aloud twice before students write their guess.

× Grades 3-5 A cat smells like... NEXT WORD • ARQIV	× Grades 3-5 After school I like to... NEXT WORD • ARQIV	× Grades 3-5 The best pizza topping is... NEXT WORD • ARQIV
× Grades 3-5 The scientist looked through the... NEXT WORD • ARQIV	× Grades 3-5 When it snows, we build a... NEXT WORD • ARQIV	× Grades 3-5 My teacher always says... NEXT WORD • ARQIV
× Grades 3-5 The volcano started to... NEXT WORD • ARQIV	× Grades 3-5 In the ocean you can find a... NEXT WORD • ARQIV	× Grades 3-5 The robot opened its... NEXT WORD • ARQIV
× Grades 3-5 Once upon a... NEXT WORD • ARQIV	× Grades 3-5 The astronaut floated toward the... NEXT WORD • ARQIV	× Grades 3-5 At the zoo, the loudest animal was the... NEXT WORD • ARQIV

Cut along the dashed lines. Read each card aloud twice before students write their guess.

× Grades 6–8 The weirdest smell in the cafeteria is... NEXT WORD · ARQIV	× Grades 6–8 The detective found a clue under the... NEXT WORD · ARQIV	× Grades 6–8 If I could invent anything, I would invent a... NEXT WORD · ARQIV
× Grades 6–8 My phone battery died right before... NEXT WORD · ARQIV	× Grades 6–8 The coach yelled, “Get back on the...” NEXT WORD · ARQIV	× Grades 6–8 The experiment failed because the... NEXT WORD · ARQIV
× Grades 6–8 In 100 years, cars will... NEXT WORD · ARQIV	× Grades 6–8 The alien looked at Earth and said... NEXT WORD · ARQIV	× Grades 6–8 The best way to fall asleep is... NEXT WORD · ARQIV
× Grades 6–8 The most important skill for the future is... NEXT WORD · ARQIV	× Grades 6–8 The strangest thing about middle school is... NEXT WORD · ARQIV	× Grades 6–8 The first person to walk on Mars was... NEXT WORD · ARQIV

Cut along the dashed lines. Read each card aloud twice before students write their guess.

× Grades 9–12 The key to a good argument is... NEXT WORD • ARQIV	× Grades 9–12 Scientists were shocked to discover that... NEXT WORD • ARQIV	× Grades 9–12 The senator walked to the podium and... NEXT WORD • ARQIV
× Grades 9–12 The most overrated invention is... NEXT WORD • ARQIV	× Grades 9–12 In the year 2050, most jobs will... NEXT WORD • ARQIV	× Grades 9–12 The data clearly shows that... NEXT WORD • ARQIV
× Grades 9–12 The opposite of love is... NEXT WORD • ARQIV	× Grades 9–12 To be or not to... NEXT WORD • ARQIV	× Grades 9–12 The real reason the Roman Empire fell was... NEXT WORD • ARQIV
× Grades 9–12 The thief escaped with the... NEXT WORD • ARQIV	× Grades 9–12 Artificial intelligence is... NEXT WORD • ARQIV	× Grades 9–12 The first person to walk on Mars was... NEXT WORD • ARQIV

Read the short version first, then the longer versions. Students circle the words that changed their guess.

< Context card 1

SHORT

The dog smells like...

WITH MORE CONTEXT

A. After rolling in mud at the farm, the dog smells like...

B. Fresh from the groomer, the dog smells like...

< Context card 2

SHORT

I went to the bank to...

WITH MORE CONTEXT

A. I took my fishing pole and sat on the river bank to...

B. I got my first paycheck, so I went to the bank to...

< Context card 3

SHORT

The bat flew...

WITH MORE CONTEXT

A. The baseball player swung hard and the bat flew...

B. At sunset in the cave, the bat flew...

< Context card 4

SHORT

She opened the...

WITH MORE CONTEXT

A. Holding her new key, she opened the...

B. Starving after practice, she opened the...

< Context card 5

SHORT

The plant needs...

WITH MORE CONTEXT

A. The tomato plant on my windowsill needs...

B. The power plant that runs our city needs...

< Context card 6

SHORT

The star was...

WITH MORE CONTEXT

A. Through the telescope, the star was...

B. On the red carpet, the movie star was...

Our class *model* predicts...

Stem:

Write each word under a column and shade it up to its probability. The tallest bar is the model's prediction.

ROUND 3

Turn up the *temperature*

Rank the words on the tally board from most to least popular. Then roll the die to decide which word the model adds to the sentence.



ROLL 1-2

Take the #1 word

Cold: safe and predictable

ROLL 3-4

Take the #2 word

Warm: a little surprising

ROLL 5

Take the #3 word

Hot: creative

ROLL 6

Take any word on the board (eyes closed, point!)

Very hot: wild, maybe nonsense

Why this matters: Real AI tools have a “temperature” setting. At low temperature they almost always choose the top word, so answers are consistent. At higher temperature they sometimes choose less likely words, so answers are more varied and creative, and also more likely to go wrong.

Name: _____ Date: _____ Class: _____

My *prediction* log

For each stem, write your guess before anyone reveals theirs. Then record what the class model picked.

#	STEM	MY GUESS	CLASS #1 WORD	ITS PROBABILITY
1				
2				
3				
4				
5				

Context detective

Write the long context sentence and circle the words that changed your guess.

Cold vs. hot sentence

Cold (always #1): _____

Hot (with the die): _____

Think about it

Our class model gave a confident answer that wasn't true. Why did that happen? What does it tell you about using AI?

EXIT TICKET · NEXT WORD

Name: _____

1. In one sentence, how does an AI chatbot decide what word to write next?

2. 20 students guessed the next word. 5 said "pizza." What's the probability of "pizza"? _____

3. Why might an AI give an answer that sounds right but is false?

4. Circle one: ☐ I could explain this to my family ☐ I mostly get it ☐ I'm still confused

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Answer *notes*

1. **How does AI choose the next word?** Look for: it predicts the most likely next word (or token) based on patterns learned from lots of text, then repeats.
2. **Probability of “pizza”:** $5 \div 20 = 1/4 = 25\%$.
3. **Why false answers?** Look for: AI picks what is *likely* to come next, not what has been checked as *true*. If a false statement sounds like common writing, the model may produce it confidently.

COMMON MISCONCEPTIONS TO LISTEN FOR

- **“The AI looks it up on the internet.”** Some tools can search, but the writing itself still comes from next-word prediction.
- **“A transformer is a robot or a chip.”** It’s a method, a recipe for how the math pays attention to context. It runs on ordinary computer chips.
- **“If many people say it, it’s true.”** Popularity isn’t proof. That’s exactly why AI needs fact-checking.

Standards alignment

FRAMEWORK	CONNECTION
AI4K12 Five Big Ideas	#3 Learning (computers learn from data) and #4 Natural Interaction (how AI produces language)
CCSS Math 7.SP.C.6 / 7.SP.C.7	Approximate probability from collected data, and compare it to a probability model
CCSS ELA L.3–8.4a	Use context as a clue to the meaning of a word or phrase (Round 2)
ISTE Students 1.3 Knowledge Constructor	Evaluate the accuracy and credibility of information (Round 4)

Sources & further reading

- Vaswani, A. et al. (2017). “Attention Is All You Need.” *Advances in Neural Information Processing Systems*. The paper that introduced the transformer.
- AI4K12 Initiative (AAAI & CSTA). “Five Big Ideas in Artificial Intelligence.” ai4k12.org
- Interactive companion: arqiv.si/teachers/labs (Next Word Lab) and arqiv.si/ai/transformers

Thank you for teaching with ARQIV

This resource was made to help students think first and then learn to use AI well. We hope it sparks great conversations in your classroom.

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