



COMPLETE UNIT • GRADES 4-12

The Think-First *Unit*

Six weeks, six lessons, one routine. Students think on paper first, then use AI for one structured step and prove they own the result. Everything you need to teach it is in this file.

GRADES 4-12

6 WEEKS • 1 LESSON A WEEK

MOSTLY SCREEN-FREE

ADVISORY • ELA • SCIENCE • MATH • CS

WHAT'S INSIDE

- The Think-First method: 5 P's, AI levels, assessment
- 6 student worksheets & 6 rubrics
- Classroom AI agreement & AI receipt
- 6 complete lesson plans with scripts
- Adjustments for younger, older & no-device classes
- Family letter, student portfolio & certificate

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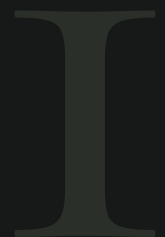
Scope & sequence

WEEK	LESSON	THINKING HABIT	AI LEVEL
Week 1	The detective's notebook	Ask questions before answers	L1
Week 2	Problem first, prompt second	Estimate and check	L1
Week 3	The thought experiment lab	Reason without an answer key	L1
Week 4	Socratic seminar with a machine	Argue with evidence	L2
Week 5	Write the brief	Communicate clearly	L3
Week 6	Character before the computer	Create something original	L3

PART 1

The Think-First *method*

Why bans and detectors fall short, the 5 P's routine, AI use levels, and assessment that rewards thinking.



Why we can't just *catch* it

AI detectors don't work well enough to grade by.

OpenAI shut down its own AI-text classifier in 2023 because of its "low rate of accuracy." A Stanford-led study in the journal *Patterns* found that popular detectors wrongly flagged more than half of essays written by non-native English speakers as AI-generated.

Bans protect thinking but leave a gap.

Handwritten work and in-class tests are worth keeping. But students still meet AI at home, and they'll meet it at work. If school never teaches them to use it well, someone else will teach them to use it badly.

THE ANSWER

The fix isn't catching. It's designing.

When the grade comes from a student's questions, plans, critiques and spoken explanations, copying from AI stops being useful. Assess the process, and you don't have to police the product.

The 5 P's of *thinking first*

Use this routine for any assignment where AI is allowed. Four of the five steps happen with screens off. It works for a 45-minute lesson or a three-week project.

Ponder	Plan	Partner (AI)	Probe	Prove
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I Ponder

◦ SCREENS OFF

Students think before anything else touches the problem. They ask questions, list ideas, sketch, estimate, recall what they know and notice what they don't.

Teacher moves: Pose an open question; require a written first answer before discussion; use think-pair-share.

Evidence of thinking: Handwritten notes, sketches, estimates and first answers.

2 Plan

◦ SCREENS OFF

Students turn their thinking into something precise: a brief, a hypothesis, a principle, a thesis, success criteria.

Teacher moves: Give a template; have partners test whether a plan is clear enough to act on.

Evidence of thinking: A written plan someone else could act on.

3 Partner

• AI ON •
SHORT

AI is brought in for one specific job, named in advance: options, the other side, feedback, a new explanation, or a draft to critique.

Teacher moves: Run it on the teacher's screen if needed. Ask for options, not answers. Keep a receipt of every prompt.

Evidence of thinking: The AI receipt: prompts, responses, notes.

4 Probe

◦ SCREENS OFF

Students interrogate what AI produced. What's right, wrong, missing, invented, generic or biased? Did it agree too easily?

Teacher moves: Ask it to argue the opposite. Require one claim checked against a real source.

Evidence of thinking: Annotated AI output and a checked claim.

5 Prove

◦ SCREENS OFF

Students make the final work their own and defend it, revising by hand and explaining their choices.

Teacher moves: Two-minute defense; a twin problem or short response with no AI; a reflection.

Evidence of thinking: Final work, defense notes and reflection.

AI use *levels* for every assignment

Label every assignment with a level so students never have to guess what's allowed. Adapted from the AI Assessment Scale by Perkins, Furze, Roe & MacVaugh.

	No AI	Show what you can do on your own. Handwritten, in class. Example: In-class essay, unit test, the "Prove" step
	AI after thinking	AI only after you've done your own thinking, to test or challenge it. Example: Argue with AI after writing your thesis
	AI as feedback	AI can give feedback or questions on your own draft. It doesn't write for you. Example: "What's the weakest part of my argument?"
	AI as collaborator	AI can help create parts of the work from your brief. You document everything. Example: AI concept art from your character brief, revised by you
	AI exploration	The assignment is about exploring AI itself: testing it, breaking it, comparing tools. Example: Investigate where image generators show bias

Assessment that rewards *thinking*

Six simple ways to make the process visible and the product less important.

Collect the Ponder page

Grade the handwritten first ideas, questions and estimates. They show where the thinking started.

Two-minute defense

A short conversation ("Why this flaw? Why this source?") reveals ownership instantly.

AI receipts

Students attach every prompt, what came back, and what they kept or rejected.

Grade the Probe

Reward students for finding AI's mistakes, gaps and biases.

Versions

Compare drafts. A perfect first draft with no history raises a question.

Twin problems

End with a short, AI-free task that uses the same skill.

How to teach this *unit*

Pacing

Teach one lesson a week for six weeks, as an AI literacy unit, an advisory or homeroom series, or a dedicated “AI lab” block. Lessons 4 and 6 run across two sessions.

The one-screen setup

Every lesson works with a single teacher screen. The class decides what to ask, one person types, and everyone takes notes. Students never need their own AI account, which avoids age-requirement and privacy problems.

Before week 1

- Post the 5 P’s and the AI use levels.
- Review the classroom AI agreement together, then send it home with the family letter.
- Print a supply of AI receipts.
- Choose one AI tool your district has approved and try each lesson’s prompts yourself first.

The rising AI level

Week 1	The detective’s notebook	L1
Week 2	Problem first, prompt second	L1
Week 3	The thought experiment lab	L1
Week 4	Socratic seminar with a machine	L2
Week 5	Write the brief	L3
Week 6	Character before the computer	L3

Each week builds one thinking habit before adding more AI. By week 6, students use AI as a collaborator, from a brief they wrote themselves.

Pair it with

- **Next Word** (how chatbots write) in week 1 or 2
- **Train the Machine** (how AI learns from data) in week 3
- **Spot the Hallucination** (checking AI) in week 4
- Free interactive labs at arqiv.si/teachers/labs

PART 2

Six *lessons*

One lesson a week, one thinking habit at a time. Each includes the full plan with scripts, a student worksheet, a rubric and adjustments.

1. Week 1 · The detective's notebook
2. Week 2 · Problem first, prompt second
3. Week 3 · The thought experiment lab
4. Week 4 · Socratic seminar with a machine
5. Week 5 · Write the brief
6. Week 6 · Character before the computer

2

The detective's *notebook*

Students crack a mystery using clues, hypotheses and tests. Then they interview AI as a witness, and learn that a witness who sounds sure isn't the same as a detective who has checked the evidence.

LEVEL 1 • AI AFTER THINKING

GRADES 4–10

50 MINUTES

SCIENCE • ANY SUBJECT

PAPER + 1 TEACHER SCREEN

THE BIG IDEA

AI can be a witness. You are the detective.

STUDENTS WILL BE ABLE TO, WITHOUT AI

- Generate several hypotheses from clues
- Match evidence for and against each hypothesis
- Design a simple test
- Sort a witness's statements by how reliable they are

LESSON AT A GLANCE

Ponder	Plan	Partner	Probe	Prove
15 min	8 min	10 min	10 min	7 min + optional test

THINKING HABIT THIS WEEK

Ask questions before answers

BEFORE YOU TEACH

- ☐ Print one worksheet per student (Lesson 1 worksheet)
- ☐ Set up one teacher screen with a district-approved AI tool
- ☐ Try the Partner-step prompts yourself first
- ☐ Print AI receipts if students will use AI
- ☐ Post the AI use level: **Level 1 • AI after thinking**

MY NOTES

Lesson *flow*

I Ponder

15 min

◦ SCREENS OFF

Hand out (or read) the case file. Teams list every possible explanation before choosing one.

1. **The case of the wilting plant:** The class plant is drooping. Its lowest leaves are yellow. It is watered every day. The soil is always damp and smells sour. The pot has no hole in the bottom. It sits near a sunny window.
2. List at least three hypotheses (too much water, too little light, too hot, pests, not enough food...).
3. For each, write the clues that support it and the clues against it.
4. Rank them from most to least likely.

“Detectives don’t start with a suspect. They start with the evidence.”

2 Plan

8 min

◦ SCREENS OFF

Teams plan how they would prove it.

1. Pick your top hypothesis.
2. Design a test that could prove it wrong. (What would you change? What would you watch?)
3. Write two questions for the “witness.”

3 Partner

10 min

• AI ON

On the teacher’s screen, teams interview AI as a witness. Type exactly what students ask.

1. Students record each statement the AI makes. Notice: did it ask for more clues, or jump to an answer?

AI / PROMPT

My plant is drooping and its lowest leaves are turning yellow. What could cause that?

AI / PROMPT

[Team question, e.g.] Could it be too much water if the soil smells sour?

4 Probe

10 min

◦ SCREENS OFF

Screens off. Teams sort the witness statements.

1. Sort each AI statement: **matches our clues**, **general information**, **a guess**, or **contradicts our evidence**.
2. Which statements could the AI not have known without seeing the plant?
3. Did the AI change your ranking? Why or why not?

5 Prove

7 min + optional
test

◦ SCREENS OFF

Teams write a case report in their own words.

1. Conclusion, the three strongest pieces of evidence, and what would change your mind.
2. Optional: run the test over a week (stop watering, add drainage) and report back.
3. **Teacher key:** The clues point to overwatering with no drainage, leading to root rot (sour smell, constantly damp soil, yellowing lower leaves).

Detective's notebook

Case file: the wilting plant

LEVEL 1 • AI AFTER THINKING

Name: _____

Date: _____

Class: _____

Hypotheses (at least three)

Evidence for and against my top hypothesis

My test: what will I change and what will I watch?

Witness statements (AI) and how I sorted them

M = matches clues · G = general info · ? = guess · X = contradicts evidence

Case report: conclusion, strongest evidence, what would change my mind

Grade the *thinking*

CRITERIA	4 • EXCELLENT	3 • SOLID	2 • DEVELOPING	1 • BEGINNING
Hypotheses	Several plausible hypotheses tied to clues	Two or more plausible hypotheses	One hypothesis	None
Use of evidence	Weights evidence for and against each	Uses evidence for the top hypothesis	Mentions clues loosely	No evidence
Test design	Test could clearly prove the hypothesis wrong	Reasonable test	Vague test	No test
Witness sorting	Accurately sorts and explains reliability	Sorts most statements	Sorts a few	Accepts all statements

WHY THIS IS HARD TO CHEAT

The case file is unique to your classroom, the reasoning happens in teams on paper, and the AI is just one witness whose statements must be judged against the class's evidence.

Adjust it

Younger students	Use picture clue cards and only two hypotheses. The teacher acts as the AI witness's typist and reader.
Older students	Write your own case file from a real local problem (a school energy bill spike, a drop in lunch participation) and investigate it.
No devices at all	Print three AI witness statements in advance (one helpful, one general, one confidently wrong) for teams to sort.

Discussion questions

- Why is a confident witness not always a reliable one?
- What questions make a witness more useful?
- Where do real investigators (doctors, mechanics, scientists) use this same process?
- When should you trust an AI's answer?

Extensions & connections

- Run the real experiment and graph the results.
- Connect to how AI scientists check discoveries: [AI in space](#).
- Pair with [Fact-check the bot](#).

Problem first, *prompt second*

Students solve a real problem on paper using a four-step method, estimate the answer, and then perform an “autopsy” on an AI solution that sounds right but isn’t.

LEVEL 1 • AI AFTER THINKING

GRADES 6–12

45 MINUTES

MATH • SCIENCE

PAPER ONLY (AI SAMPLE PROVIDED)

THE BIG IDEA

If you can’t estimate the answer, you can’t tell when a machine gets it wrong.

STUDENTS WILL BE ABLE TO, WITHOUT AI

- Use a four-step problem-solving method
- Estimate before calculating
- Find and explain an error in a confident-sounding solution
- Explain a solution so a younger student could follow it

LESSON AT A GLANCE

Ponder	Plan	Partner	Probe	Prove
12 min	5 min	8 min	12 min	8 min

THINKING HABIT THIS WEEK

Estimate and check

BEFORE YOU TEACH

- ☐ Print one worksheet per student (Lesson 2 worksheet)
- ☐ Set up one teacher screen with a district-approved AI tool
- ☐ Try the Partner-step prompts yourself first
- ☐ Print AI receipts if students will use AI
- ☐ Post the AI use level: **Level 1 • AI after thinking**

MY NOTES

Lesson *flow*

I Ponder

12 min

◦ SCREENS OFF

Students meet the problem with pencils only. They use George Pólya's classic four steps from *How to Solve It* (1945): understand, plan, solve, look back.

1. **The problem:** A school has 600 students. Three-quarters ride the bus. Each bus holds 52 students. How many buses does the school need?
2. **Understand:** What do you know? What are you asked? Circle the trap words.
3. **Estimate:** Before calculating, about how many buses? Write it down.
4. **Solve:** Work it out on paper.
5. **Look back:** Does your answer make sense in the real world?

“Calculators didn’t make math class pointless, they made checking more important. AI is the same.”

2 Plan

5 min

◦ SCREENS OFF

Students write what a correct answer must look like before seeing the AI's.

1. A correct answer must be about ___ because ___.
2. List one mistake you think is easy to make here.

3 Partner

8 min

• AI ON

Students receive an AI-written solution (printed on the worksheet, or shown by the teacher). It is fluent, confident and wrong.

1. Optional: on the teacher's screen, ask a current AI the same problem and compare. (Today's AI often gets this right. That's fine: the skill is checking.)

AI / PROMPT

“First, $\frac{3}{4}$ of 600 is 450 students who ride the bus. Next, divide 450 by 52 seats per bus: $450 \div 52 = 8.65$. Since you can't have part of a bus, round to the nearest whole number. The school needs 8 buses.”

4 Probe

12 min

◦ SCREENS OFF

Screens off. Students do an **answer autopsy**.

1. Check each step. Which steps are correct?
2. Find the error. (8 buses only carries 416 students, leaving 34 behind. You must round *up* to 9.)
3. Compare the AI's answer with your estimate. Would your estimate have caught it?
4. Write the rule the AI broke in your own words.

5 Prove

8 min

◦ SCREENS OFF

Students show they own the skill without any help.

1. Solve the twin problem on the worksheet with no help.
2. Explain the bus problem so a 5th grader could understand it.
3. Exit ticket: "The best way to check an AI's math is..."

Answer autopsy

Solve it yourself first. Then check the AI.

LEVEL 1 • AI AFTER THINKING

Name: _____

Date: _____

Class: _____

1 • Understand: what do I know and what am I asked?

2 • My estimate before calculating

3 • My solution

4 • The AI's solution

$\frac{3}{4}$ of 600 = 450 students ride the bus. $450 \div 52 = 8.65$ You can't have part of a bus, so round to the nearest whole number. Answer: 8 buses.

5 • Where is the error, and what rule did the AI break?

6 • Twin problem: 920 people attend a game. Vans hold 15 people. How many vans to bring everyone home?

7 • Explain the bus problem to a 5th grader

Grade the *thinking*

CRITERIA	4 • EXCELLENT	3 • SOLID	2 • DEVELOPING	1 • BEGINNING
Understanding & estimate	Identifies key info and a reasonable estimate with reasoning	Reasonable estimate	Estimate off or unexplained	No estimate
Own solution	Correct with clear steps and correct rounding	Correct with minor gaps	Partially correct	Incorrect
Answer autopsy	Finds the error, explains why it matters in the real world	Finds the error	Senses something wrong but can't locate it	Accepts the AI answer
Explanation	A younger student could follow it	Mostly clear	Confusing in parts	Missing

WHY THIS IS HARD TO CHEAT

The AI answer is supplied, so there's nothing to gain by looking one up. The twin problem and the "explain it to a 5th grader" task are done in class on paper.

Adjust it

Younger students	Use smaller numbers (60 students, buses of 25) and pictures of buses to count.
Older students	Have students write their own "trap" problem and a fluent but wrong AI-style solution for a classmate to autopsy.
No devices at all	Already device-free. The AI solution is printed on the worksheet.

Discussion questions

- Why does a wrong answer feel more believable when it's written confidently?
- When is a small error dangerous in real life? (Medicine doses, bridge loads, budgets.)
- Should you trust a calculator? An AI? What's the difference?
- What habits help you catch your own mistakes?

Extensions & connections

- Science version: give an AI-style lab conclusion that ignores a variable and have students find it.
- Connect to how AI can be confidently wrong: [how transformers predict words](#).
- Careers: engineers, pharmacists and accountants all check numbers for a living.

The thought *experiment lab*

Some questions can't be looked up; they have to be reasoned through. Students work through classic dilemmas about AI on paper, discover their own principles, and then test them against an AI's strongest counterargument.

LEVEL 1 • AI AFTER THINKING

GRADES 7–12

50 MINUTES

SOCIAL STUDIES • ELA • ETHICS

PAPER + 1 TEACHER SCREEN

THE BIG IDEA

When there's no answer key, your reasoning is the answer.

STUDENTS WILL BE ABLE TO, WITHOUT AI

- State a moral principle in their own words
- Notice when changing one detail changes their answer, and why
- Steelman an opposing view
- Judge whether an AI's argument is actually strong

LESSON AT A GLANCE

Ponder	Plan	Partner	Probe	Prove
15 min	10 min	10 min	10 min	5 min + seminar

THINKING HABIT THIS WEEK

Reason without an answer key

BEFORE YOU TEACH

- ☐ Print one worksheet per student (Lesson 3 worksheet)
- ☐ Set up one teacher screen with a district-approved AI tool
- ☐ Try the Partner-step prompts yourself first
- ☐ Print AI receipts if students will use AI
- ☐ Post the AI use level: **Level 1 • AI after thinking**

MY NOTES

Lesson *flow*

I Ponder

15 min

◦ SCREENS OFF

Read the dilemma aloud. Students write their answer and one reason *before* any discussion.

1. **The dilemma:** A self-driving car's brakes fail. It can stay in its lane and hit three people who stepped into the road, or swerve and hit one person on the sidewalk. What should it be programmed to do?
2. Write your answer and your reason.
3. **Change one detail.** What if the one person is a child? What if the three were jaywalking? What if the person in the car is you? Write whether your answer changes each time.
4. Circle the detail that changed your mind the most. That's a clue to your real principle.

"There's no right answer to look up, and I'm not grading whether you agree with me. I'm grading how well you think."

2 Plan

10 min

◦ SCREENS OFF

Students turn their gut reaction into a principle they can defend.

1. Complete: "A self-driving car should _____ because _____."
2. Predict the two strongest objections someone could raise.
3. Write one question you want to ask the AI to test your principle.

3 Partner

10 min

• AI ON

On the teacher's screen, the class asks AI to argue against the principles students wrote. AI is a sparring partner, not a judge.

1. Run 3–4 student principles. Students copy the AI's main point in their own words.

AI / PROMPT

Here is a student's principle: "[principle]". Give the single strongest argument against it, in plain language, in under 120 words.

AI / PROMPT

How would a philosopher who judges actions by their outcomes answer this dilemma? How would one who believes some actions are always wrong answer it?

4 Probe

10 min

◦ SCREENS OFF

Screens off. Students evaluate the AI like a debate judge.

1. Was the AI's argument actually strong, or did it just sound confident?
2. Did it dodge the question or pretend there's one right answer?
3. Did it just agree with whatever it was told? (Try asking it to argue the opposite next time.)
4. **Real-world check:** MIT's Moral Machine experiment collected about 40 million decisions from people in 233 countries and territories, and found people's choices varied by culture. Who should decide what real cars do?

5 Probe

5 min + seminar

◦ SCREENS OFF

Students defend their position without any screen.

1. Rewrite your principle. Did you keep it, change it or add an exception? Explain why.
2. Optional: hold a 15-minute Socratic circle where students must respond to the strongest opposing argument first.
3. Exit ticket: one thing the other side gets right.

Thought experiment lab

Write your own thinking first. There is no answer key.

LEVEL 1 • AI AFTER THINKING

Name: _____

Date: _____

Class: _____

My first answer and reason

Change one detail: did my answer change?

- ☐ If the one person is a child
- ☐ If the three were jaywalking
- ☐ If the person in the car is me

My principle: "A self-driving car should ____ because ____."

Two objections I predict

The AI's strongest argument, in my own words

Was it actually strong? Why or why not?

My final principle (kept, changed or added an exception) and why

Grade the *thinking*

CRITERIA	4 • EXCELLENT	3 • SOLID	2 • DEVELOPING	1 • BEGINNING
Reasoning	Clear principle with reasons that hold across variations	Clear principle with reasons	Opinion with weak reasons	No reasoning given
Counterarguments	Anticipates strong objections and answers them	Names objections	Names a weak objection	None
Evaluating the AI	Judges strength, spots dodges or flattery, explains why	Judges the argument with a reason	Agrees or disagrees without reasons	Copies the AI
Revision	Thoughtfully revises or defends with new insight	Revises or defends with a reason	Minimal change, little explanation	No final position

WHY THIS IS HARD TO CHEAT

There's nothing to copy. Each student's first answer, variations and final principle are handwritten in class, and the AI only appears on the teacher's screen to argue with them.

Adjust it

Younger students	Use a gentler dilemma: "Should a robot helper always tell the truth, even if it hurts someone's feelings?"
Older students	Add the Chinese Room thought experiment: if a computer answers perfectly in a language it doesn't understand, does it understand? Connect to how transformers work.
No devices at all	The teacher prepares two AI counterarguments in advance on a handout. Students judge them on paper.

Discussion questions

- Should companies, governments or voters decide how self-driving cars make choices?
- Why might people in different countries answer differently?
- Can an AI have a principle, or only predict what people would say?
- What did you learn about your own values today?

Extensions & connections

- Read about the Moral Machine experiment (Awad et al., Nature, 2018).
- Write a short policy memo for a city deciding whether to allow robotaxis.
- See how self-driving cars work on [AI in engineering & robots](#).

Socratic seminar *with a machine*

Students prepare a position on paper, then cross-examine an AI arguing the other side: demanding evidence, checking a source and watching for flattery. The seminar itself is screen-free.

LEVEL 2 • AI AS FEEDBACK

GRADES 8–12

TWO 45-MIN SESSIONS

ELA • SOCIAL STUDIES • DEBATE

PAPER + 1 TEACHER SCREEN

THE BIG IDEA

You don’t really understand your side until you can state the other side’s best argument.

- STUDENTS WILL BE ABLE TO, WITHOUT AI
- Build a position with reasons and evidence
 - Ask probing questions that test a claim
 - Sort claims into evidence, opinion and unsupported
 - Represent an opposing view fairly in their own words

LESSON AT A GLANCE

Ponder	Plan	Partner	Probe	Prove
15 min • session 1	10 min • session 1	15 min • session 1	15 min • session 2	30 min • session 2

THINKING HABIT THIS WEEK

Argue with evidence

BEFORE YOU TEACH

☐ Print one worksheet per student (Lesson 4 worksheet)

☐ Set up one teacher screen with a district-approved AI tool

☐ Try the Partner-step prompts yourself first

☐ Print AI receipts if students will use AI

☐ Post the AI use level: **Level 2 • AI as feedback**

MY NOTES

Lesson *flow*

I Ponder

15 min · session
1

◦ SCREENS OFF

Students take a side on a debatable question. Use the default or swap in your own.

1. **Question:** "Should high school students be allowed to use AI on homework?"
2. Write your position and three reasons.
3. For each reason, write what evidence or experience supports it.
4. Write the best argument for the *other* side, as you understand it now.

2 Plan

10 min · session
1

◦ SCREENS OFF

Students prepare to interrogate the AI.

1. Write three questions that would expose a weak argument ("What's your evidence for...?" "What about students who...?").
2. Write one claim you expect the AI to make, so you can check if it does.

3 Partner

15 min · session
1

• AI ON

On the teacher's screen, the AI argues against the majority view. Students take turns asking their prepared questions while the class takes notes.

AI / PROMPT

Argue the side of "[position]" in a debate with high school students. Be persuasive but honest. Give evidence where you can and say when something is your opinion.

AI / PROMPT

A student asks: "[question]". Answer directly in under 100 words.

AI / PROMPT

Now argue the opposite side just as strongly.

4 Probe

15 min · session
2

◦ SCREENS OFF

Screens off. Students audit the AI's debate performance.

1. Label each AI claim in your notes: **E** (evidence), **O** (opinion), **U** (unsupported).
2. Did it cite a study or statistic? As a class, check one: does it exist, and does it say what the AI said?
3. When asked to argue the opposite side, how easily did it switch? What does that tell you about whether AI "believes" anything?
4. Did it flatter the questioner or agree too easily when challenged? AI chatbots have a known tendency to tell people what they want to hear.

5 Prove

30 min · session
2

◦ SCREENS OFF

A full Socratic seminar with no devices.

1. Inner circle discusses the question; outer circle tracks who uses evidence and who responds to the other side.
2. Rule: before disagreeing, you must restate the other person's point fairly.
3. Exit ticket: the strongest point from the side you disagree with, in your own words.

Cross-examination notes

Prepare your position before the AI speaks.

LEVEL 2 • AI AS FEEDBACK

Name: _____

Date: _____

Class: _____

My position and three reasons

Evidence for each reason

Three questions to test the AI

AI claims I heard (label E / O / U)

We checked one source. Did it say what the AI claimed?

- ☐ Yes, accurately
- ☐ Partly / exaggerated
- ☐ No, or the source didn't exist

Exit ticket: the other side's strongest point, in my words

Grade the *thinking*

CRITERIA	4 • EXCELLENT	3 • SOLID	2 • DEVELOPING	1 • BEGINNING
Position & evidence	Clear position, strong reasons, relevant evidence	Clear position with reasons	Position with weak reasons	Unclear position
Questioning	Questions expose real weaknesses	Relevant questions	Surface-level questions	No questions
Claim audit	Accurately labels claims and checks a source	Labels most claims	Few labels, no check	None
Seminar & fairness	Restates others fairly and builds on them	Participates with evidence	Participates without evidence	Does not participate

WHY THIS IS HARD TO CHEAT

The preparation is handwritten in class, the AI only appears on one shared screen, and the grade comes from questioning, auditing and a live, screen-free seminar.

Adjust it

Younger students	Use a lighter question ("Should our school have a four-day week?") and give sentence starters for questions.
Older students	Assign students to argue the side they disagree with in the seminar, using the AI's arguments as raw material they must improve.
No devices at all	Print an AI-written argument in advance (with at least one unsupported claim and one real statistic) for students to audit.

Discussion questions

- Can an AI that argues both sides equally well be trusted on either?
- Why might a chatbot tend to agree with whoever is talking to it?
- What's the difference between winning an argument and finding the truth?
- When should you change your mind?

Extensions & connections

- Have students write a fair, one-page summary of both sides for a school newsletter.
- Read our [research explainers](#) and practice labeling claims by evidence type.
- Pair with [Fact-check the bot](#).

Write *the brief*

Students learn that a good prompt is really a design brief, the same kind of document engineers and product managers write every day. A vague request gets a generic result; clear thinking gets a useful one.

LEVEL 3 • AI AS COLLABORATOR

GRADES 6–12

45 MINUTES

ENGINEERING • ART • ANY SUBJECT

PAPER + 1 TEACHER SCREEN

THE BIG IDEA

The clearer your thinking, the better any tool, or any teammate, can help you.

STUDENTS WILL BE ABLE TO, WITHOUT AI

- Define a problem, audience, constraints and success criteria
- Write a brief someone else could act on
- Judge outputs against their own criteria
- Explain why clear specifications matter in real jobs

LESSON AT A GLANCE

Ponder	Plan	Partner	Probe	Prove
12 min	10 min	10 min	8 min	5 min + build

THINKING HABIT THIS WEEK

Communicate clearly

BEFORE YOU TEACH

- ☐ Print one worksheet per student (Lesson 5 worksheet)
- ☐ Set up one teacher screen with a district-approved AI tool
- ☐ Try the Partner-step prompts yourself first
- ☐ Print AI receipts if students will use AI
- ☐ Post the AI use level: **Level 3 • AI as collaborator**

MY NOTES

Lesson *flow*

I Ponder

12 min

◦ SCREENS OFF

Teams pick a real design challenge from school life.

1. **Choose one:** a poster that gets more students to the science fair; a better lunch-line system; a sign that reduces hallway crowding.
2. Who is it for? What problem does it solve?
3. What must it include? What must it *not* do?
4. How will you know it worked? Write two measurable success criteria.

“In real jobs, people who can explain exactly what they need are the ones who get great results, from people and from AI.”

2 Plan

10 min

◦ SCREENS OFF

Teams write a one-page brief on the worksheet.

1. Goal · Audience · Must have · Must not · Constraints (size, budget, time) · Tone or style in words · How we'll judge it.
2. Trade briefs with another team: could they build it from your words alone? Revise.

3 Partner

10 min

• AI ON

On the teacher's screen, run two prompts side by side for one or two teams' challenges.

1. Students note differences between the vague and the briefed result.

AI / PROMPT

Make a poster about the science fair.

AI / PROMPT

[Paste the full team brief] Using this brief, design the poster.
Explain how each part meets the success criteria.

4 Probe

8 min

◦ SCREENS OFF

Screens off. Score both results against the team's own success criteria.

1. Score each result 1–4 on each criterion.
2. What did the vague prompt force the AI to guess?
3. What did the AI still get wrong, even with the brief?
4. What would you change in your brief next time?

5 Prove

5 min + build

◦ SCREENS OFF

Teams present the journey.

1. Present: our brief → what AI made → what we changed → our final idea.
2. Build or sketch the final version by hand.
3. Reflection: where else is a clear brief useful? (Group projects, jobs, asking a teacher for help.)

Design brief

Clear thinking in, useful results out.

LEVEL 3 • AI AS COLLABORATOR

Name: _____

Date: _____

Class: _____

Goal: what problem are we solving?

Audience: who is it for?

Must have

Must not

Constraints (size, budget, time, materials)

Style or tone, in words

How we'll judge success (two measurable criteria)

Score: vague prompt vs. our brief, and what we'd change

Grade the *thinking*

CRITERIA	4 • EXCELLENT	3 • SOLID	2 • DEVELOPING	1 • BEGINNING
Problem definition	Specific goal, audience and success criteria	Clear goal and audience	Vague goal	Missing
Brief quality	Another team could act on it without questions	Mostly actionable	Several gaps	Not usable
Evaluation	Scores outputs fairly against criteria and explains	Scores outputs	Opinion only	None
Iteration & reflection	Improves the brief and connects to real work	Improves the brief	Minor changes	No reflection

WHY THIS IS HARD TO CHEAT

Students are graded on the brief, the scoring and the reflection, all done by hand. The AI output is a shared class example, not something a student hands in as their own.

Adjust it

Younger students	Use a fill-in-the-blank brief with pictures. The teacher compares a vague and a detailed drawing request.
Older students	Write a real product requirements document for a school app idea, including user stories and what the first version will leave out.
No devices at all	The teacher prepares two printed outputs in advance (vague prompt and detailed brief) for students to score.

Discussion questions

- Why does a vague request get a generic result, from a person or an AI?
- Who writes briefs in real jobs? (Engineers, product managers, architects, film directors.)
- What's the difference between telling AI what to do and thinking for it?
- How could a clear brief help in a group project?

Extensions & connections

- Careers: product manager, engineer, architect, UX designer.
- See how engineers set goals for AI-designed parts on [AI in engineering & robots](#).
- Use the brief template for any project in any class.

Character before *the computer*

Students build an original character on paper — what they want, fear, hide and look like — before they ever ask AI to help draw or develop it. AI becomes a sketch partner for ideas they already own.

LEVEL 3 • AI AS COLLABORATOR

GRADES 5–12

TWO 45-MIN SESSIONS

ELA • ART • MEDIA

PAPER + 1 TEACHER SCREEN

THE BIG IDEA

AI can draw anything. Only you can decide who your character is.

STUDENTS WILL BE ABLE TO, WITHOUT AI

- Build a character with a want, a fear, a flaw and a conflict
- Choose visual details that show personality, not just appearance
- Explain every creative choice in their own words
- Spot when an AI result is generic, biased or off-brief

LESSON AT A GLANCE

Ponder	Plan	Partner	Probe	Prove
25 min • session 1	15 min • session 1	20 min • session 2	15 min • session 2	20 min + homework

THINKING HABIT THIS WEEK

Create something original

Where this lesson comes from: ARQIV's founder uses this exact process at home with his son, who is creating his own manga. Before the computer goes on, they talk through the story: who the character is, what his flaw is, what he looks like and why, and what stands in his way. Only then do they bring in AI to help design him.

BEFORE YOU TEACH

- ☐ Print one worksheet per student (Lesson 6 worksheet)
- ☐ Set up one teacher screen with a district-approved AI tool
- ☐ Try the Partner-step prompts yourself first
- ☐ Print AI receipts if students will use AI
- ☐ Post the AI use level: **Level 3 · AI as collaborator**

MY NOTES

Lesson *flow*

I Ponder

25 min · session
1

◦ SCREENS OFF

Students invent a character from nothing but questions. Stick figures welcome. The goal is depth, not drawing skill.

1. **Want:** What does your character want more than anything?
2. **Fear:** What are they most afraid of? Why?
3. **Flaw:** What habit or weakness gets them into trouble?
4. **Secret:** What do they hide from other characters?
5. **Look:** Choose three visual details that *show* personality (a cracked phone screen, a jacket two sizes too big). For each, write why.
6. **Conflict:** Who or what stands in their way? What will they have to give up?
7. **Change:** How will they be different by the end of the story?
8. Sketch a rough thumbnail of the character in pencil.

“*Today the computer is the last thing we touch. A character with no flaw is boring, and AI can’t give your character a reason to exist. That part is yours.*”

2 Plan

15 min · session
1

◦ SCREENS OFF

Students turn their notes into a **character brief**: a clear description someone else (or something else) could work from.

1. Fill in the brief on the worksheet: name, want, fear, flaw, three visual details with reasons, setting, conflict and mood.
2. Describe style in words (“bold ink lines, high contrast, rainy city”) instead of naming a living artist.
3. Swap briefs with a partner. Can they picture your character from the words alone? Fix anything vague.

3 Partner

20 min • session
2

• AI ON

Now AI helps *develop* the character. Students ask for options, never for the answer. In a no-device classroom, the teacher runs prompts for 3–4 volunteer briefs on the projector while everyone watches and takes notes.

1. Generate 2–3 visual concepts from the brief using any approved image tool.
2. Ask AI for options that test the character, not replace your thinking.
3. Write down every prompt you used (the “AI receipt”).

AI / PROMPT

Here is my character brief: [paste]. Give me 3 different ways their flaw could cause a problem in the first chapter. Don’t write the story.

AI / PROMPT

Draw a character based on these details: [three visual details + style in words]. Show a full-body pose that shows their mood: [mood].

4 Probe

15 min • session
2

• SCREENS OFF

Screens off again. Students compare what AI produced against their brief, like an editor.

1. What did AI get right? Circle it on your printout or notes.
2. What did it miss, change or invent that you didn’t ask for?
3. What looks generic or cliché, like every other character?
4. What did AI assume? (Gender, skin tone, body type, age.) Did you ask for that?
5. Pick one AI idea to keep, one to reject, and explain both.

5 Prove

20 min + homework

• SCREENS OFF

Students make the final version their own, by hand, and defend it.

1. Draw or revise the final character sheet by hand (or trace and change an AI concept, clearly marked).
2. Create a 4-panel storyboard or a one-page scene that shows the flaw in action.
3. Give a 60-second pitch: who this character is and why each choice was made.
4. Hand in the brief, the AI receipt, the critique and the final, so the whole process is visible.

Character brief

Think first. Fill this in before you use any AI tool.

LEVEL 3 · AI AS COLLABORATOR

Name: _____

Date: _____

Class: _____

Character name and age

What do they want more than anything?

What are they most afraid of?

Their flaw: what gets them into trouble?

Three visual details that show personality, and why

Example: "a cracked phone screen — he never takes care of his things"

The conflict: who or what stands in their way?

Rough sketch

After AI: one idea I kept and why / one I rejected and why

Grade the *thinking*

CRITERIA	4 • EXCELLENT	3 • SOLID	2 • DEVELOPING	1 • BEGINNING
Depth of character	Want, fear, flaw and conflict connect and drive a story	All parts present and mostly connected	Some parts thin or unconnected	Mostly surface details
Clarity of the brief	Someone else could picture the character from words alone	Mostly clear with minor gaps	Vague in several places	Too unclear to use
Critique of AI	Specific notes on matches, misses, clichés and assumptions	Notes matches and misses	General opinion only	No critique
Ownership & pitch	Explains every choice; final work clearly the student's	Explains most choices	Some choices unexplained	Can't explain choices

WHY THIS IS HARD TO CHEAT

The grade lives in the brief, the critique, the hand-made final and the spoken pitch. A student who let AI do everything can't answer "why did you give him that flaw?" Process is visible from the first pencil note.

Adjust it

Younger students	Use a character template with pictures and sentence starters ("My character wants..."). The teacher runs all AI steps on the board.
Older students	Add a second character whose want directly conflicts with the first. Write a full scene and analyze where AI suggestions pushed the story toward clichés.
No devices at all	Skip image generation. The teacher reads the brief aloud to an AI chat on the projector and asks for three plot complications; students critique them on paper.

Discussion questions

- If AI drew it, who is the artist?
- Why do AI images often default to the same kinds of faces and bodies?
- Is it fair to type a living artist's name into an image prompt? Why or why not?
- What part of your character could AI never have come up with?

Extensions & connections

- Turn the storyboard into a short comic using hand-drawn panels.
- Art connection: compare an AI concept with a hand-drawn concept and discuss what each does better.
- Careers: concept artist, animator, game designer, writer. See [what's next in AI](#).

PART 3

Templates & *tools*

The classroom AI agreement, AI receipt, family letter, student portfolio, certificate, sources and standards.



Our classroom AI *agreement*

1. I think first. I write down my own ideas before I use AI.
2. I check the level. Every assignment says how much AI is allowed (Level 0–4). If I’m not sure, I ask.
3. I use AI for a job, not for my brain. I ask for options, feedback or a counterargument, not for my answer.
4. I keep receipts. I save every prompt I use and what came back.
5. I question everything. AI can be wrong, biased or made up. I check at least one claim.
6. I own my work. I can explain every choice in my own words.
7. I protect privacy. I don’t share personal information about myself or others with AI tools.
8. I follow the tool’s rules, including age requirements.

Student signature: _____ Date: _____

Family signature: _____

AI receipt

Name: _____

Date: _____

Class: _____

Assignment

AI level allowed

My thinking BEFORE AI (my first ideas)

Tool used and date

Prompt 1

What came back (summary)

What I kept and why

What I rejected and why

One claim I checked, and where

In one sentence, what is MINE in this work?

A note to *families*

Dear families,

Over the next six weeks, our class is learning how to think first and then use artificial intelligence (AI) tools well. AI is already part of many jobs, and our goal is for students to graduate able to think independently *and* direct these tools wisely.

What this looks like in class: most of our work stays on paper. When AI is used, it's for one short, structured step, usually on the teacher's screen, and students must explain what they kept, what they rejected and why. Students will not need their own AI account.

What we're practicing: asking good questions, estimating and checking, reasoning through hard choices, arguing with evidence, communicating clearly, and creating original work.

How you can help: ask your child at dinner, *"What did you think before you asked the AI?"* Please read and sign the classroom AI agreement with your child.

Thank you,

Teacher name · contact

My Think-First *portfolio*

Name: _____

Class: _____

WEEK	WHAT I THOUGHT FIRST	WHAT AI ADDED	WHAT I KEPT, CUT OR CHANGED
Week 1 Ask questions before answers			
Week 2 Estimate and check			
Week 3 Reason without an answer key			
Week 4 Argue with evidence			
Week 5 Communicate clearly			
Week 6 Create something original			
Looking back: which thinking habit will I use most, and where?			

ARQIV · THINK-FIRST UNIT

Certified *Think-First* Thinker

This certifies that

has completed six weeks of thinking first: asking questions, estimating and checking, reasoning, arguing with evidence, communicating clearly and creating original work, and has learned to use AI as a tool, not a replacement.

Teacher

Date

Sources & *standards*

Sources

- OpenAI (2023). "New AI classifier for indicating AI-written text." Update: classifier discontinued July 2023 due to low accuracy.
- Liang, W. et al. (2023). "GPT detectors are biased against non-native English writers." *Patterns* 4(7).
- Perkins, M., Furze, L., Roe, J. & MacVaugh, J. The AI Assessment Scale.
- Pólya, G. (1945). *How to Solve It*. Princeton University Press.
- Awad, E. et al. (2018). "The Moral Machine experiment." *Nature* 563, 59–64.
- AI4K12 Initiative. "Five Big Ideas in Artificial Intelligence." ai4k12.org

Standards connections

FRAMEWORK	WHERE IT SHOWS UP
AI4K12 Five Big Ideas	#4 Natural Interaction and #5 Societal Impact throughout; #3 Learning in weeks 1–3
ISTE Students 1.3 Knowledge Constructor	Probe steps: evaluating accuracy and credibility
CCSS ELA W.1 / SL.1	Argument writing and collaborative discussion (weeks 3–4)
CCSS Math Practice 1 & 3	Make sense of problems; critique the reasoning of others (week 2)
NGSS Science & Engineering Practices	Asking questions, planning investigations, arguing from evidence (week 1); defining problems (week 5)

Online companions: every lesson is also free at arqiv.si/teachers with print buttons, and the interactive student labs are at arqiv.si/teachers/labs.

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.

You may

- Print and copy this resource for the students in your own classes.
- Display it on your classroom projector or board.
- Share it with students through a password-protected learning platform (Google Classroom, Canvas, Schoology and similar).

Please don't

- Share it with other teachers, a whole school or a district. Send them to **arqiv.si/teachers/resources** instead, or ask us about a school license.
- Post it on a public website, or sell or redistribute it in any form.
- Use it to train or fine-tune an AI model.

Questions, school licenses & workshops

Email **steve.ryan@arqiv.fm**. We also run Think-First workshops for staff and families.

FREE ONLINE COMPANIONS

Interactive versions of our games and labs are at **arqiv.si/teachers/labs**. Students can use them on any device, with no login.

ARQIV resources are written by people and reviewed for accuracy. Facts were checked against the sources listed in each kit as of 2026. AI changes quickly. If you spot anything that needs updating, please tell us.