Workshop Materials: Prompt Engineering for AI-Powered Educational Games and Interactive Learning

This workshop aims to equip educators with practical skills to harness generative AI for creating engaging, personalized learning experiences that foster creativity and social cohesion in teacher education.

The Transformative Wave of Generative AI in Education

We stand at the cusp of a significant paradigm shift in education, driven by the rapid advancements in generative Artificial Intelligence (AI), or perhaps more accurately termed, alternative intelligence.

Paradigm Shift

Education is experiencing a fundamental transformation as generative AI introduces new possibilities for teaching and learning.

Alternative Intelligence

Moving beyond traditional AI, these systems represent a new form of intelligence that can generate novel content and solutions.

Educational Revolution

This technological evolution promises to reshape how we design learning experiences, assess understanding, and engage students.

From Pattern Recognition to Complex Reasoning

These powerful systems, inspired by biological neural networks but trained through distinct processes, are moving beyond simple pattern recognition (System 1 thinking) towards more complex reasoning capabilities (System 2 thinking).

Pattern Recognition

Early AI systems excelled at identifying patterns in data, similar to our intuitive, fast "System 1" thinking processes.

Transitional Capabilities

Modern AI systems are developing intermediate abilities that bridge pattern recognition with more sophisticated analysis.

Complex Reasoning

Advanced generative AI is now demonstrating "System 2" thinking capabilities, including logical reasoning, problem-solving, and creative generation.

The Expanding Impact of AI in Education

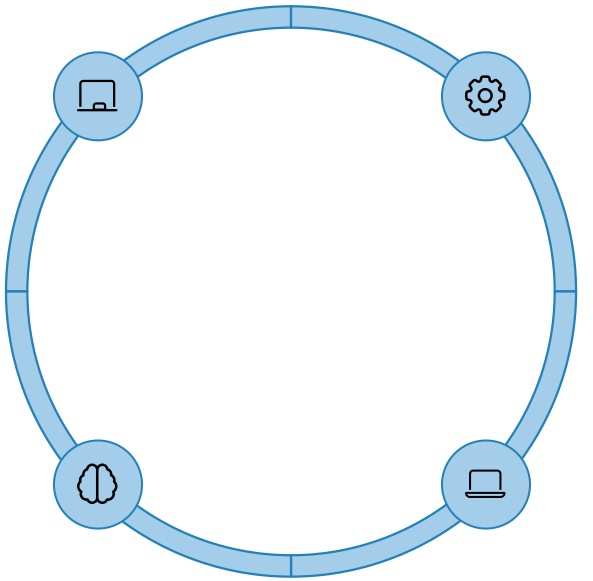
This evolution, particularly evident in Large Language Models (LLMs) and multimodal AI, holds profound implications for every facet of the educational landscape

Pedagogical Approaches

Transforming teaching methodologies through personalized learning paths and adaptive content.

Learning Experience

Reimagining how students engage with content through multimodal, interactive, and personalized approaches.



Teacher Tools

Enhancing educator capabilities with AI-powered assessment, content creation, and administrative support.

Learning Management Systems

Evolving from static repositories to dynamic, interactive learning environments.

Beyond Digitization: The Generative AI Revolution

Digitization Era

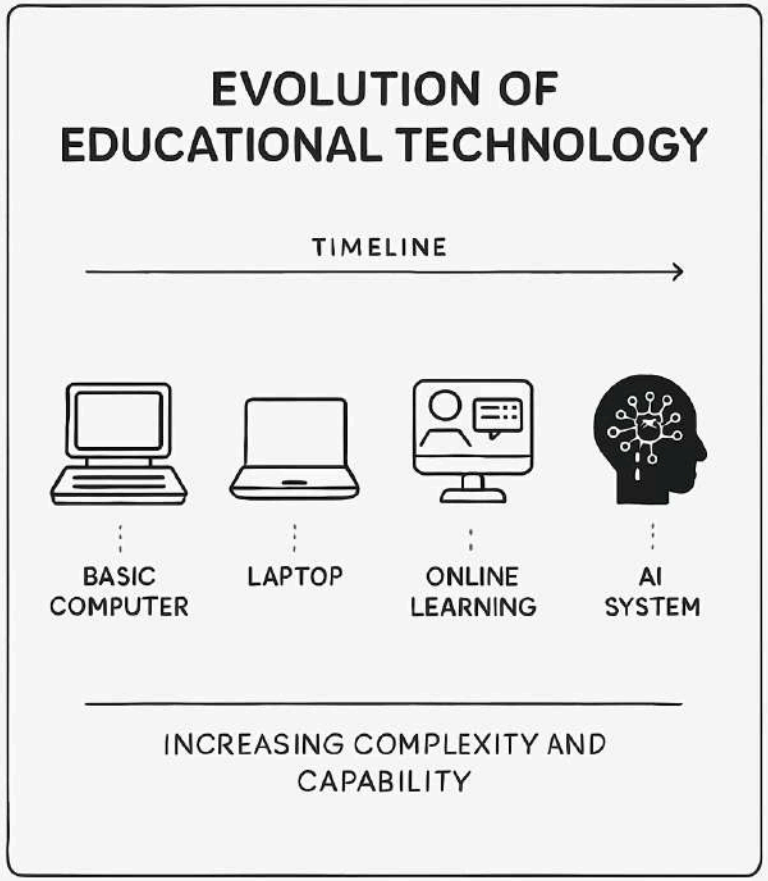
Technology primarily focused on moving existing educational processes online.

Automation Phase

Systems developed to handle routine tasks like grading and content delivery.

Generative Revolution

AI becomes a creative partner, generating novel content and personalized learning experiences.



The Evolving Role of Educators

Knowledge Provider

Traditional role as primary source of information and expertise.

Learning Guide

Shifting to facilitate discovery and critical thinking rather than direct instruction.

Experience Designer

Creating engaging, personalized learning journeys with AI assistance.

AI Collaborator

Partnering with AI to generate materials, provide feedback, and automate administrative tasks.

Transforming Learning Management Systems

Learning Management Systems (LMS) are also poised for transformation. Current LMS platforms often serve as static repositories for course content and grades. Integrating generative AI could turn them into dynamic, interactive learning environments.

Intelligent Tutoring

AI-powered tutoring systems embedded within the LMS provide personalized guidance and support.

Automated Feedback

Generative AI offers detailed, constructive feedback on assignments, helping students improve.

Adaptive Learning Pathways

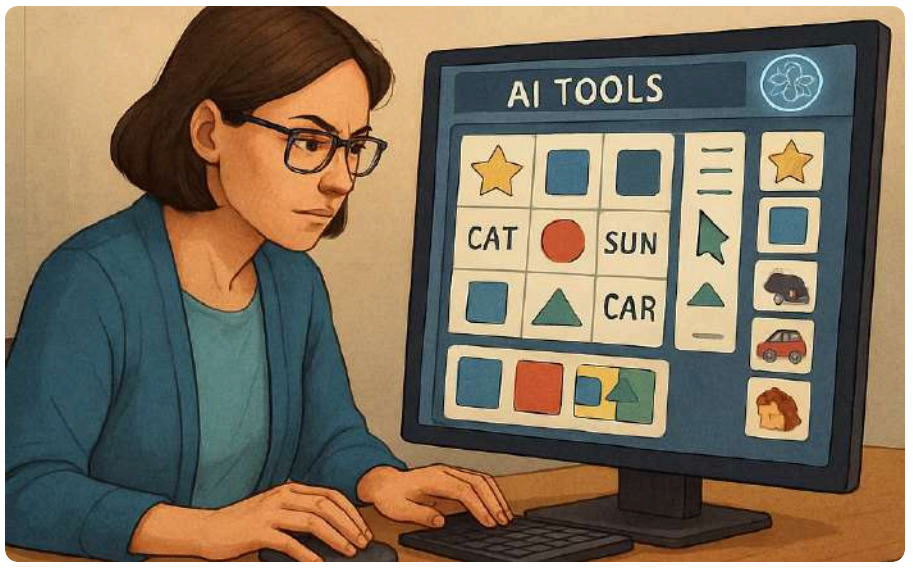
Systems that adjust content and difficulty based on individual student progress and performance.

On-Demand Explanations

AI generates summaries or explanations of complex topics tailored to student needs.

Democratizing Educational Resource Creation

Teachers, even without programming expertise, can leverage these tools to build interactive educational prototypes, design game-based learning activities, and generate multimedia content.



Interactive Prototypes

Educators can quickly build functional prototypes of educational games and simulations without coding knowledge.

Multimedia Content

AI enables creation of engaging videos, illustrations, and interactive elements that enhance learning materials.

Collaborative Creation

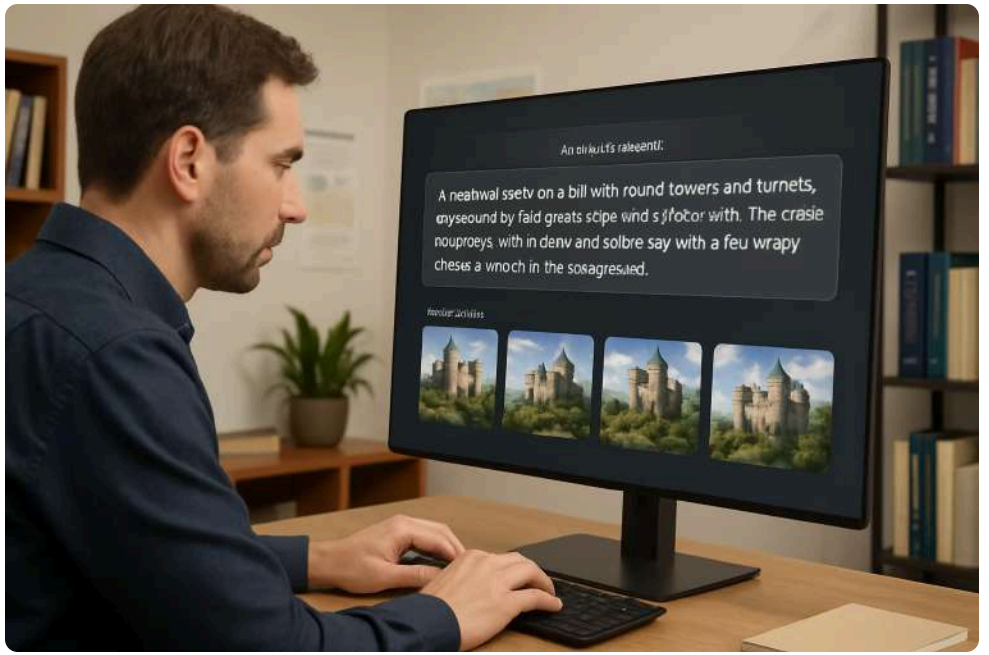
Teams of educators can work together to develop sophisticated learning experiences tailored to their specific contexts.

Prompt Engineering Fundamentals: Guiding the AI

The Art and Science

Prompt engineering combines creative thinking with systematic approaches to guide AI systems effectively. It requires understanding both the capabilities and limitations of AI models.

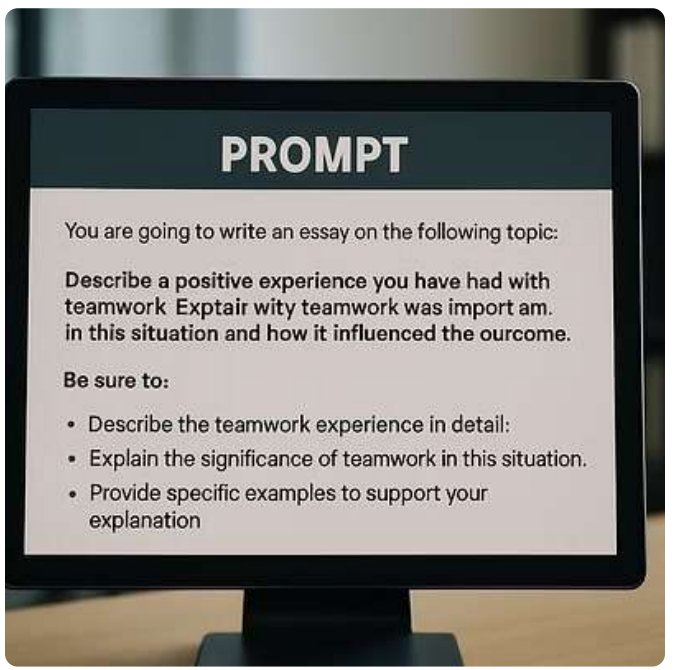
By mastering these skills, educators gain a versatile assistant for creating engaging learning experiences, personalized content, and interactive educational games.



Effective prompt engineering transforms generative AI from a generic tool into a specialized educational assistant, capable of producing precisely tailored content and concepts.

Why Prompt Engineering Matters for Educators

Think of a generative AI model like an incredibly knowledgeable and creative, yet sometimes unfocused, assistant. Without clear instructions, it might provide generic answers, misunderstand the task, or even generate inaccurate or inappropriate content.



Learning to communicate precisely with these systems is becoming an essential skill for modern educators.

Directing the AI's Focus

Prompt engineering allows you to direct the AI's focus and ensure the AI understands the specific task, context, and desired outcome.

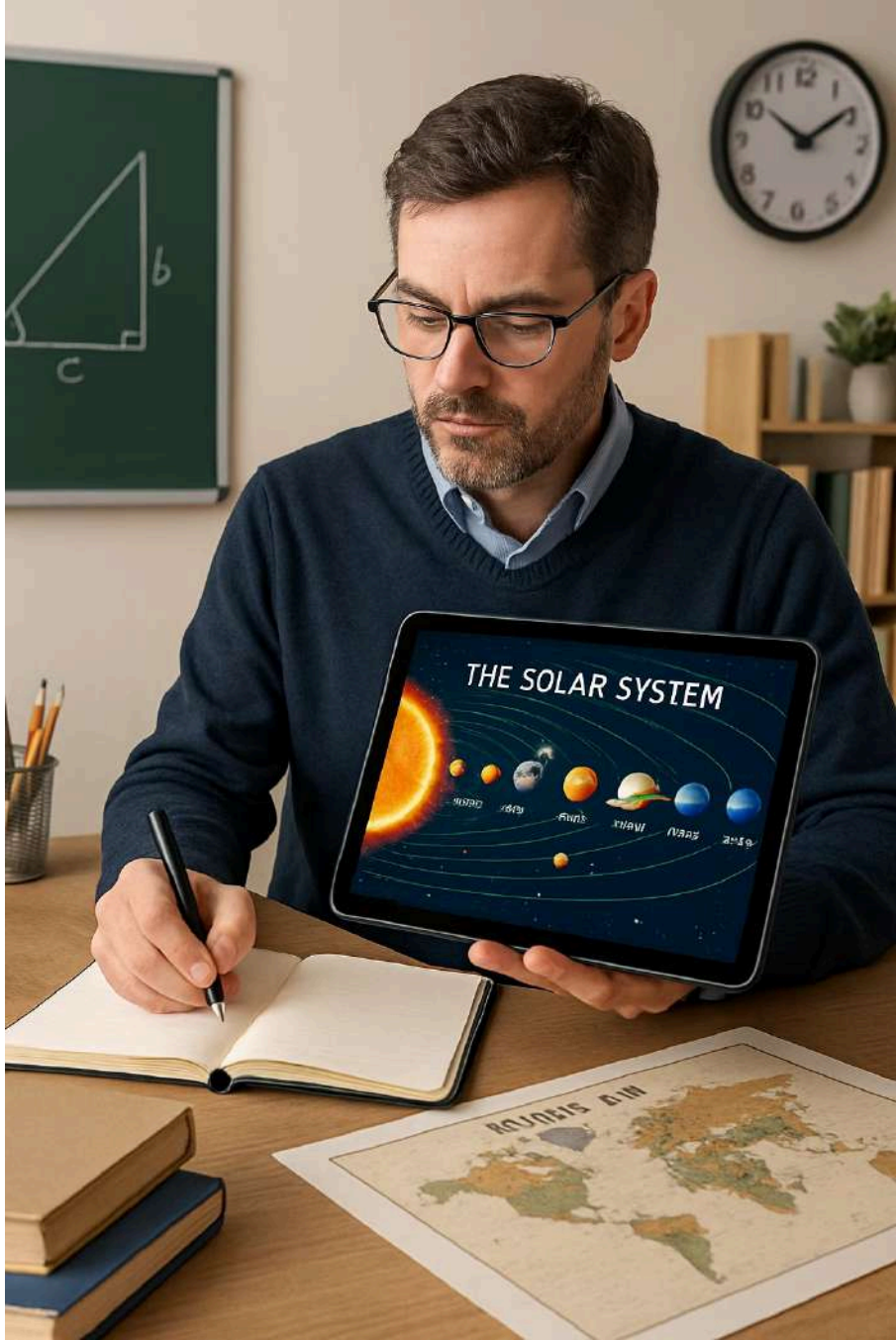
Basic Prompt	Engineered Prompt	Improvement
"Write about photosynthesis"	"Explain the process of photosynthesis focusing specifically on the role of chlorophyll for a Year 5 class."	Specifies topic focus, audience, and educational level
"Tell me about the Civil War"	"Create a 3-minute explanation of the main causes of the American Civil War for 8th grade students, emphasizing economic and social factors."	Adds length constraint, audience, and content emphasis
"Math problems"	"Generate 5 word problems involving fractions that incorporate real-world scenarios relevant to 10-year-old students."	Specifies quantity, type, relevance, and audience

Controlling Output Quality

Prompt engineering allows you to improve the accuracy, relevance, style, and tone of the generated content.

"*Summarize this article*"

"*Summarize this scientific article about climate change into three key bullet points using simple language suitable for non-experts, ensuring factual accuracy.*"



Generating Specific Formats

Instruct the AI to produce content in particular structures (e.g., lesson plans, quiz questions, dialogue scripts, code snippets).

"Give me quiz questions about planets"

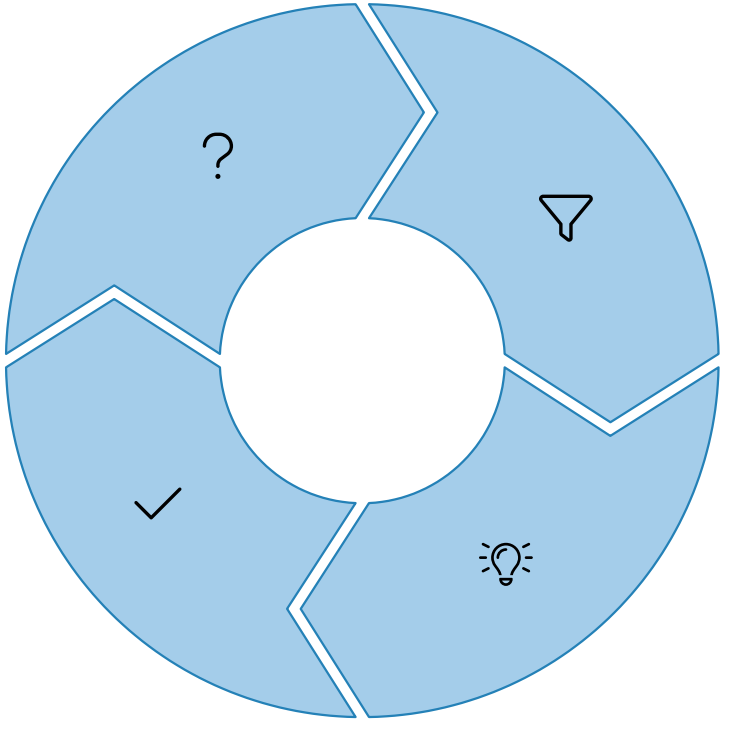
"Generate 5 multiple-choice quiz questions about the planets in our solar system, formatted as a numbered list with options A-D, and indicate the correct answer below each question."

Enhancing Creativity with AI

Use prompts to brainstorm ideas, explore different perspectives, and generate novel content for lessons and activities.

Divergent Thinking

Generate multiple creative possibilities and alternative approaches



Evaluation

Assess ideas for educational value, feasibility, and engagement

Implementation

Transform refined ideas into educational activities

Refinement

Develop promising concepts with additional prompting

"Ideas for a history project about Egypt"

"Brainstorm 5 creative project ideas for students studying Ancient Egypt, moving beyond standard reports. Include ideas involving model building, role-playing, or digital storytelling."

Mitigating Risks in AI Outputs

Factual Accuracy

Request citations, specify reliable sources, and ask for verification of key claims to ensure educational content is trustworthy.

Bias Reduction

Explicitly request balanced perspectives, diverse examples, and neutral language to create inclusive educational materials.

Hallucination Prevention

Instruct the AI to indicate uncertainty, stick to established facts, and avoid speculation in educational contexts.

Age Appropriateness

Clearly specify the target age group and request content that aligns with developmental stages and educational standards.

Creating Educational Assets with AI

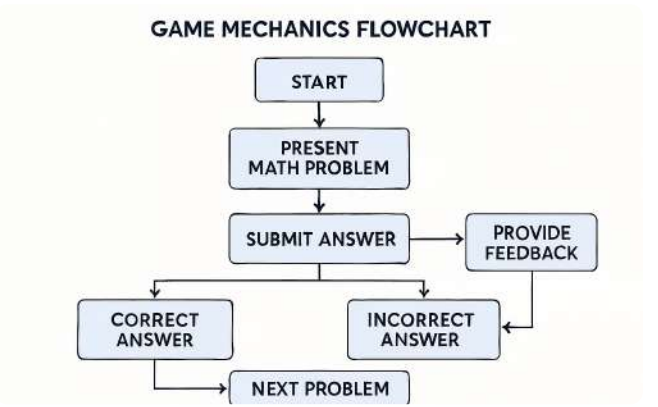
Guide AI to generate text, image prompts, code concepts, and narrative elements specifically for educational games and interactive learning.

Character Design

Generate detailed character descriptions and visual concepts for educational games, like friendly robot tutors or historical figures.

Learning Environments

Create immersive settings for educational games, from historical periods to scientific environments.



Game Mechanics

Develop concepts for interactive learning mechanics that make educational content engaging and memorable.

Deconstructing a Prompt: The Core Elements

While prompts can be simple questions, well-crafted prompts often contain several key elements that work together to guide the AI more effectively. Understanding these elements helps in designing better prompts.

Instruction

The specific task you want the AI to perform

Context

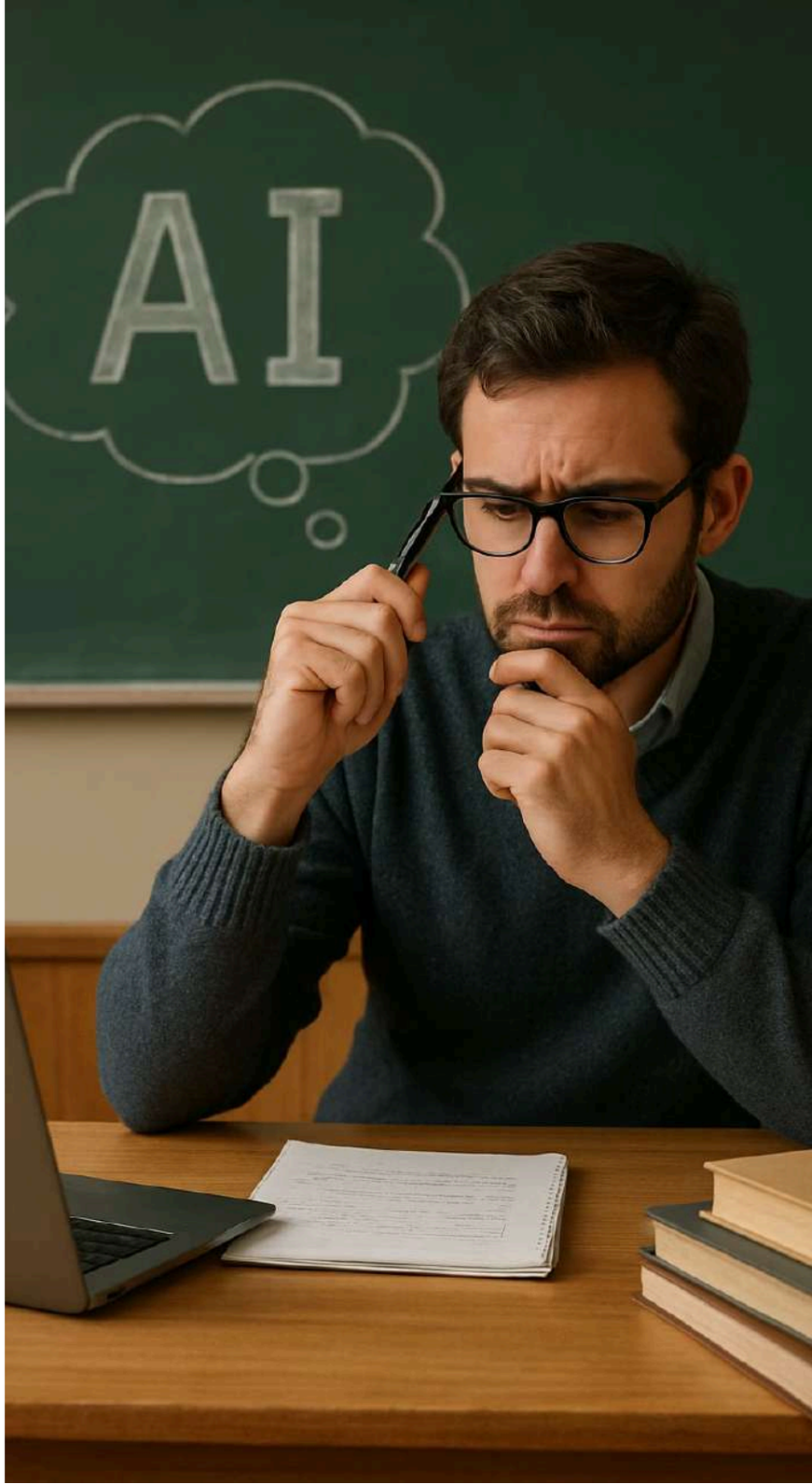
Background information that helps the AI understand the scenario

Input Data

Specific details or external knowledge to inform the response

Output Indicator

Specifications for the desired format, length, style, or structure



Crafting Clear Instructions

"Generate five multiple-choice questions about the water cycle suitable for 4th graders."

Use Action Verbs

Begin with clear action words like "create," "explain," "generate," "analyze," or "compare" to specify exactly what you want the AI to do.

Be Specific

Clearly state the subject matter, scope, and purpose of the task to avoid ambiguous or off-target responses.

Quantify When Possible

Specify numbers (e.g., "five questions," "three examples," "200-word explanation") to control the amount of content generated.

Identify the Audience

Include the intended audience (e.g., "for 4th graders," "for beginning Spanish learners") to ensure appropriate difficulty and tone.

Providing Rich Context

Context and Input Data: This provides crucial background information, constraints, specific details, or even external knowledge (files and other sources) that helps the AI understand the scenario and generate a more relevant, accurate, and tailored response.

Why Context Matters

Context narrows down the vast possibilities the AI could consider, guiding it towards the specific requirements of your task. In educational settings, providing rich context is essential for generating materials aligned with curriculum standards, student levels, and pedagogical goals.

Effective Context Elements

- Student age or grade level
- Prior knowledge assumptions
- Curriculum standards or objectives
- Time constraints for activities
- Cultural or regional considerations
- Specific learning needs or accommodations
- Available resources or technologies

External Documents for Context

A powerful way to provide context is by referencing or including content from external documents.

Guidelines & Rubrics

Providing assessment rubrics or specific curriculum guidelines ensures the AI generates content that aligns with required standards.

Templates & Structures

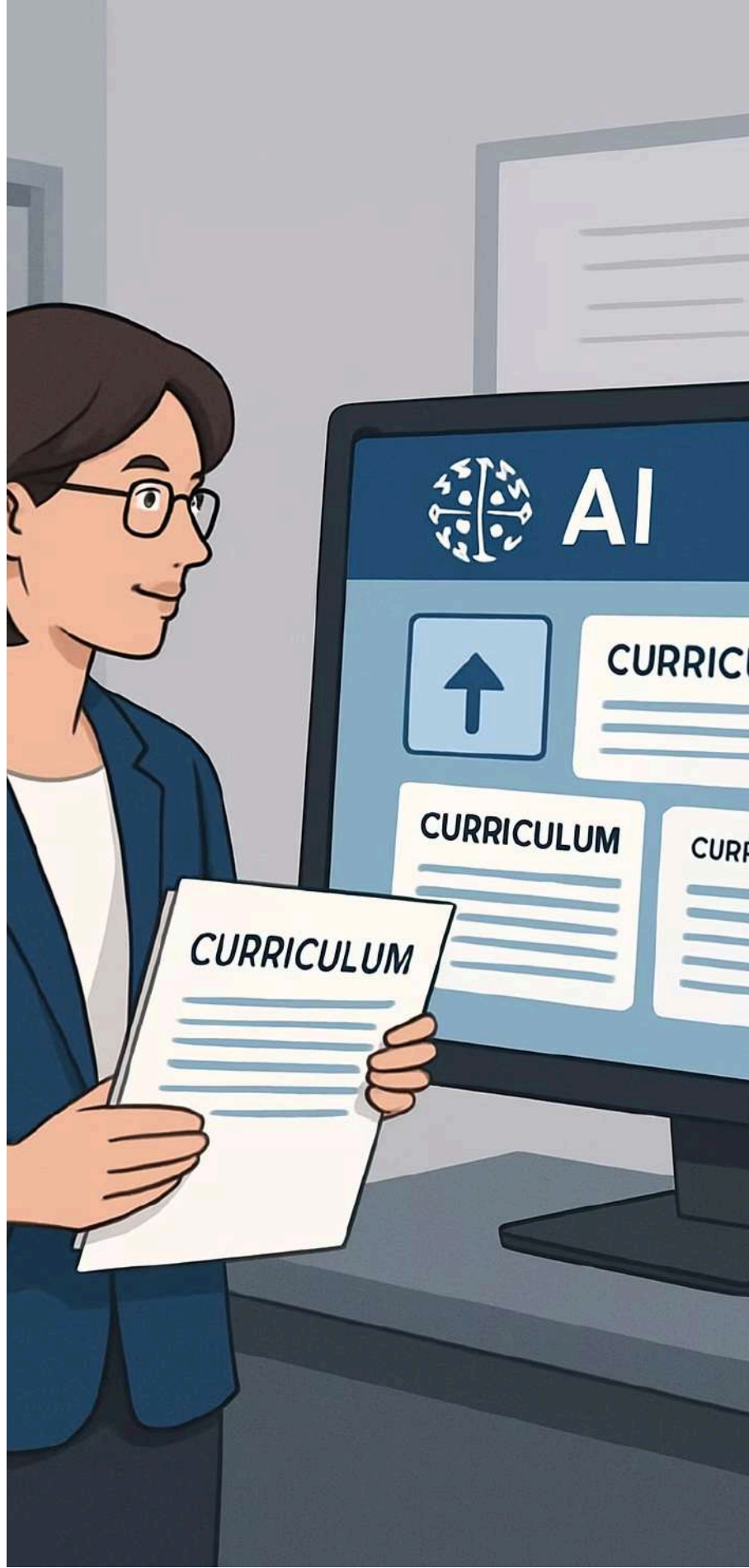
Supplying a template document helps the AI generate output in a precise format, maintaining consistency with existing materials.

Source Material

Giving the AI specific articles, textbook excerpts, or research papers allows it to base its response on authoritative information.

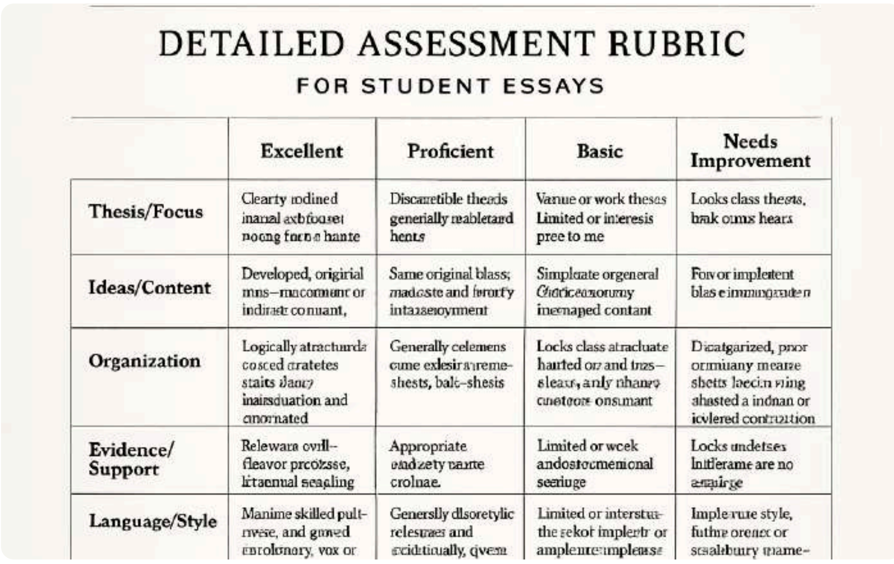
Integration & Application

The AI synthesizes this external information to produce outputs that are specific, accurate, correctly formatted, and aligned with educational requirements.



Guidelines & Rubrics as Context

"Based on the attached grading rubric [Document A], generate constructive feedback for this student essay [Document B], focusing on areas for improvement in argumentation and evidence use."



DETAILED ASSESSMENT RUBRIC
FOR STUDENT ESSAYS

	Excellent	Proficient	Basic	Needs Improvement
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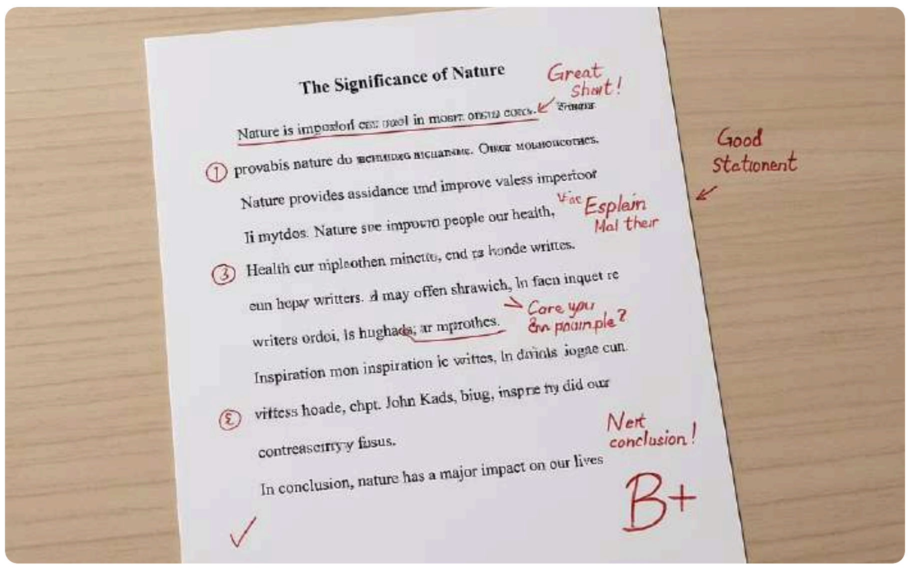
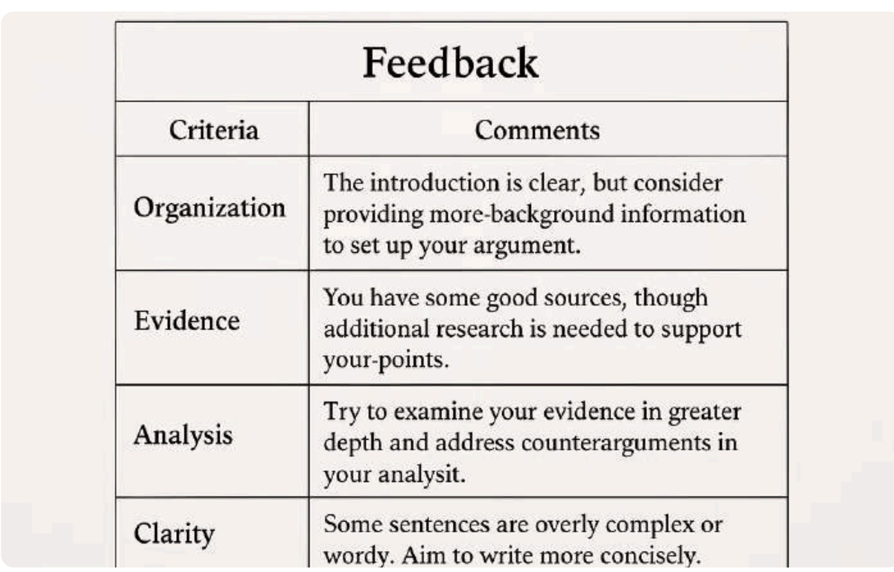
Assessment Rubric

Providing specific evaluation criteria ensures AI-generated feedback aligns with educational standards and expectations.



Student Work

Including the actual student work allows the AI to generate specific, relevant feedback rather than generic comments.



Feedback

Criteria	Comments
Organization	The introduction is clear, but consider providing more-background information to set up your argument.
Evidence	You have some good sources, though additional research is needed to support your-points.
Analysis	Try to examine your evidence in greater depth and address counterarguments in your analysit.
Clarity	Some sentences are overly complex or wordy. Aim to write more concisely.

Aligned Feedback

The resulting AI output provides targeted guidance that directly addresses the evaluation criteria and student needs.

Templates & Source Material as Context

"Using the lesson plan template provided in [Document C], create a lesson plan about the phases of the moon for Year 3 students, incorporating at least one hands-on activity."

Template-Based Prompting

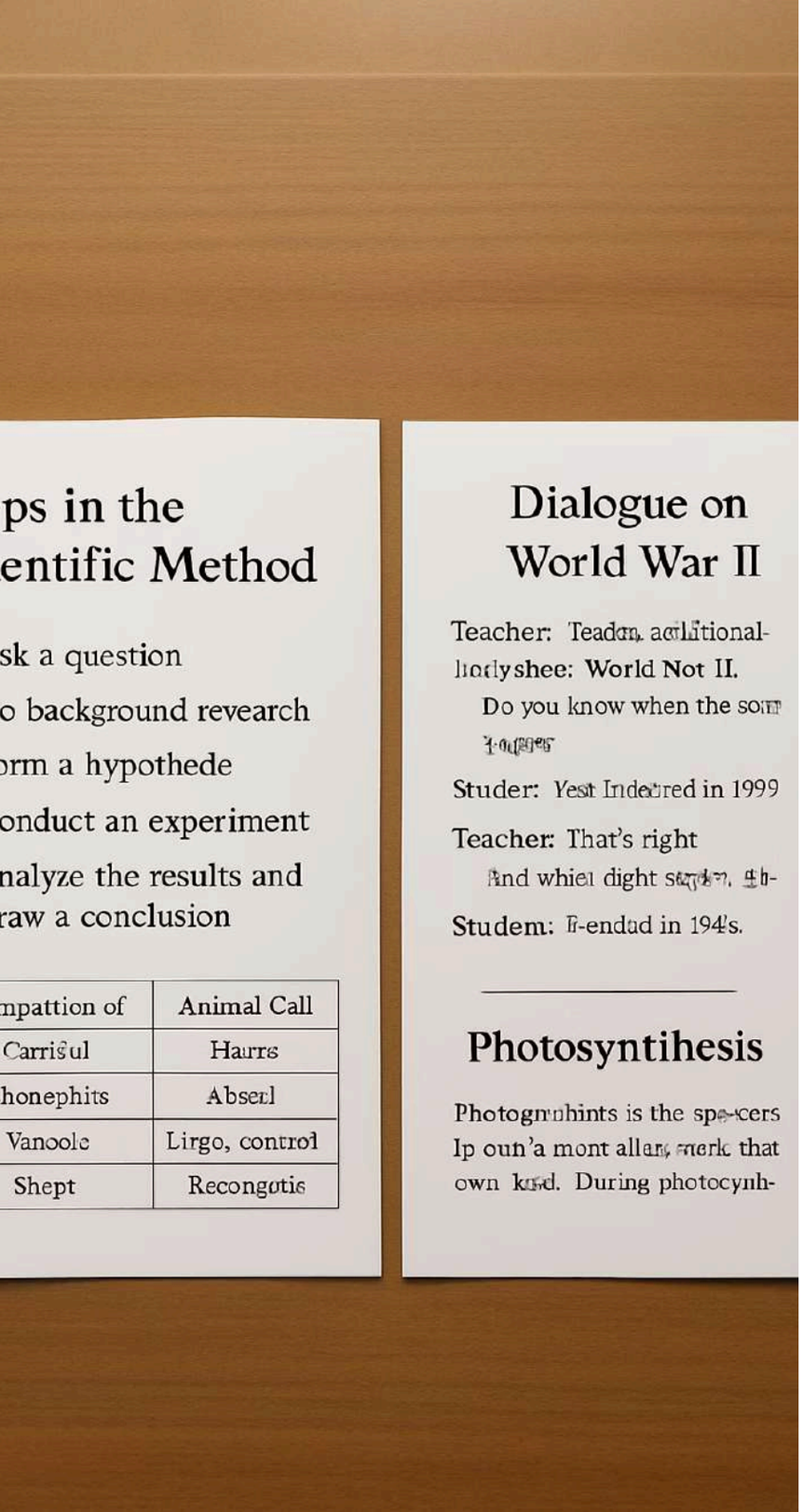
Providing templates ensures the AI generates content in exactly the format you need, maintaining consistency with existing materials and meeting institutional requirements.

This approach is particularly valuable for creating standardized educational documents like lesson plans, unit outlines, and assessment materials.

Source Material Integration

Example: "According to the information in the attached article [Document D] about renewable energy sources, explain the main advantages and disadvantages of solar power."

Using authoritative sources ensures accuracy and relevance while allowing the AI to tailor explanations to specific educational contexts and student needs.



Specifying Output Format

Output Indicator / target of the output: This specifies the desired format, length, style, or structure of the output.

Format Specifications

Clearly state the desired structure (e.g., table, list, dialogue, narrative) to ensure the AI organizes information appropriately.

Length Guidelines

Specify word count, paragraph number, or time constraints (e.g., "3-minute reading") to control content volume.

Style Instructions

Indicate tone (formal, conversational), complexity level, and stylistic preferences to match your educational context.

Technical Requirements

Request specific formats like JSON, HTML, or markdown when creating content for digital platforms or applications.

Zero-Shot Prompting

This is the most basic approach where you directly ask the AI to perform a task without providing any specific examples within the prompt itself. The AI relies entirely on its pre-existing knowledge and training data to understand and execute the request.

Information Retrieval

"Explain the main causes of World War I for a high school audience."

Brainstorming

"List five potential project ideas for a middle school science class studying renewable energy."

Simple Content Generation

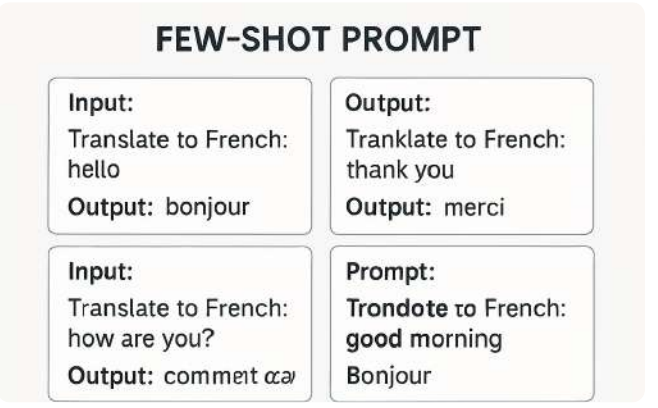
"Write a short paragraph defining 'onomatopoeia' suitable for 5th graders."

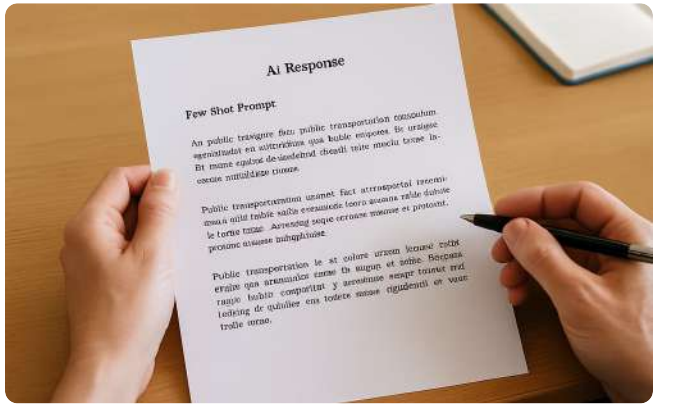
Limitation

Zero-shot prompts can sometimes lead to generic, inaccurate, or poorly formatted responses for complex tasks.

Few-Shot Prompting (In-Context Learning)

This technique significantly improves AI performance for specific tasks by providing a small number (typically 1 to 5) of examples (shots) directly within the prompt. These examples demonstrate the desired input-output pattern, format, style, or reasoning process.





Pattern Demonstration

Examples show the AI exactly what pattern or format you want it to follow, dramatically improving consistency.

Input-Output Pairs

Each example includes both the input (question/prompt) and the desired output, creating a clear model for the AI to follow.

Improved Results

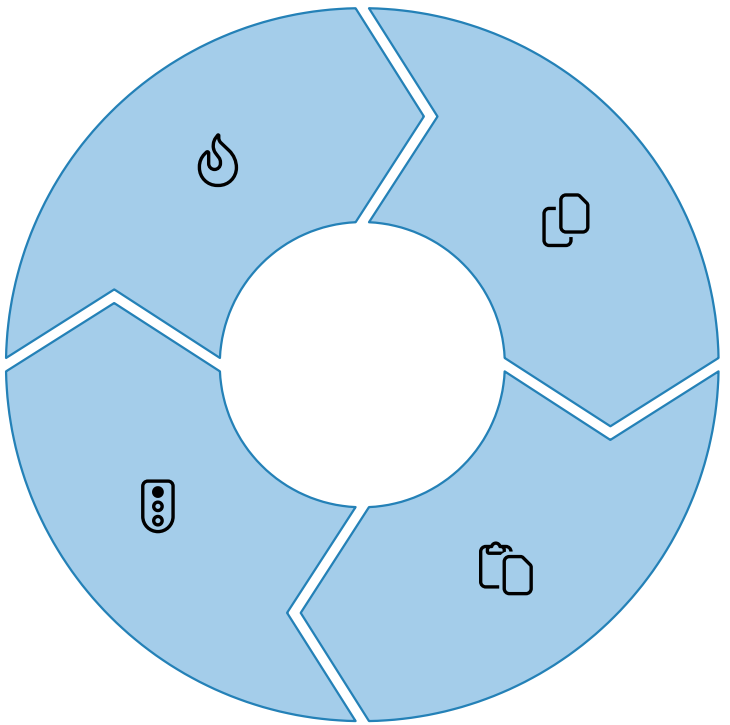
Few-shot prompting typically produces more precisely formatted and relevant outputs than zero-shot approaches.

Using External Documents for Examples

The examples provided don't always need to be typed directly into the prompt. You can paste relevant snippets from external documents or even instruct the AI to mimic the style or structure of an attached document.

Select Document

Choose a high-quality example that demonstrates the desired format or style



Extract Example

Copy relevant portions that showcase the pattern you want replicated

Provide Instructions

Ask the AI to follow the pattern for new content

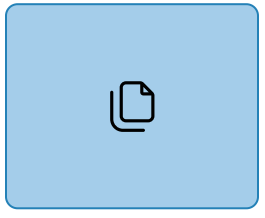
Integrate in Prompt

Include the example in your prompt with clear labeling

Educational Example (Using External Style Guide): "Summarize the key findings of the attached research paper [Document E] for a school newsletter. Follow the concise and accessible writing style demonstrated in the attached newsletter style guide [Document F]."

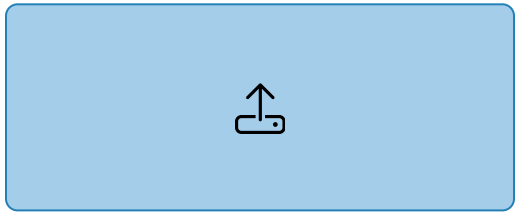
External Templates and Structures

"Generate a project proposal for a student-led initiative to reduce plastic waste in the school cafeteria. Use the same section headings and overall structure as the successful proposal attached [Document G]."



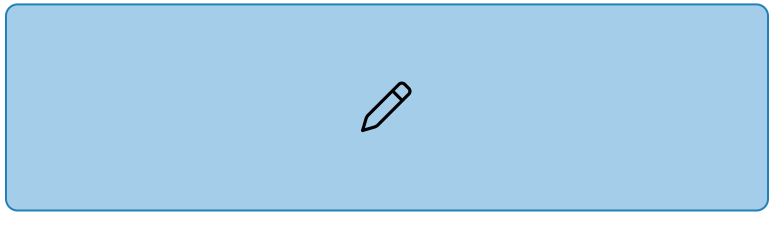
Identify Template

Select a well-structured document that follows institutional guidelines



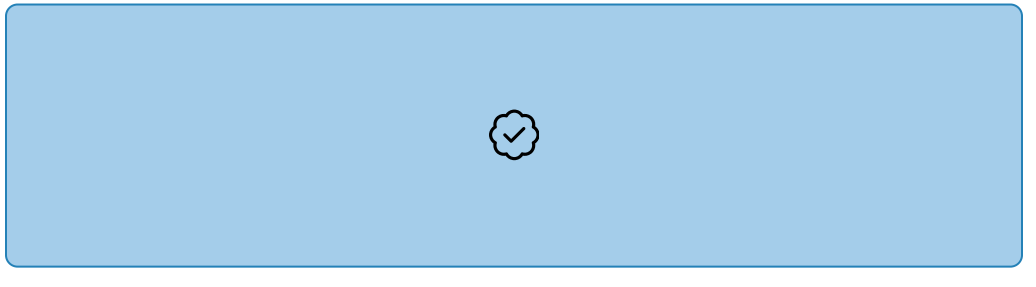
Provide as Reference

Include the template as context for the AI to analyze



Specify New Content

Clearly describe the topic and details for the new document



Review & Refine

Ensure the AI has properly followed the template structure

Few-Shot Example: Quiz Questions

Task: Generate multiple-choice questions about photosynthesis for Year 6 students. Follow the format below.

Example 1:

Q: What gas do plants absorb from the air during photosynthesis?

A) Oxygen

B) Carbon Dioxide

C) Nitrogen

D) Hydrogen

Correct Answer: B

Example 2:

Q: What pigment gives plants their green color and absorbs sunlight?

A) Chlorophyll

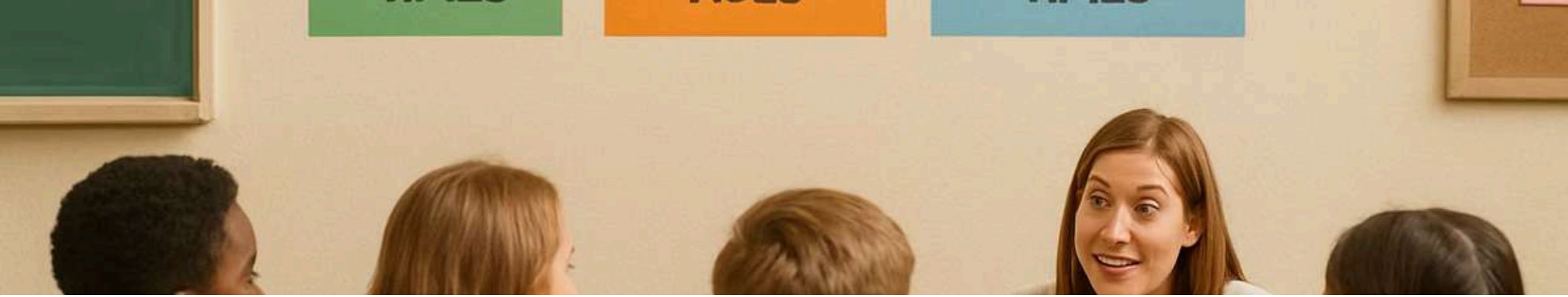
B) Carotene

C) Melanin

D) Hemoglobin

Correct Answer: A

Now generate 20 questions about the role of water in photosynthesis:



Few-Shot Example: Simplified Explanations

Task: Explain complex historical terms simply for primary school students.

Term: Industrial Revolution

Explanation: A time long ago when people started using machines to make things quickly in factories, changing how everyone lived and worked.

Term: Feudalism

Explanation: A system where kings gave land to nobles, who then had knights protect the land and peasants work on it in exchange for safety.

Term: Renaissance

Explanation:

This few-shot example demonstrates how to guide the AI to create age-appropriate explanations of complex historical concepts. By providing two clear examples, the AI learns the desired simplification pattern and tone.

Role Prompting (Persona Adoption)

This powerful technique involves instructing the AI to adopt a specific role or persona. This significantly influences the tone, style, perspective, and knowledge base it uses in its response.

Skeptical Historian

"Act as a skeptical historian evaluating the primary sources about the Boston Tea Party. What questions would you ask about this account?"

Language Tutor

"You are a friendly and encouraging language tutor. Explain the difference between 'affect' and 'effect' using simple examples."

Game Designer

"Adopt the persona of a lead game designer brainstorming ideas for an educational game about fractions for 5th graders."

Curious Student

"Respond as a curious 10-year-old student asking follow-up questions about black holes."

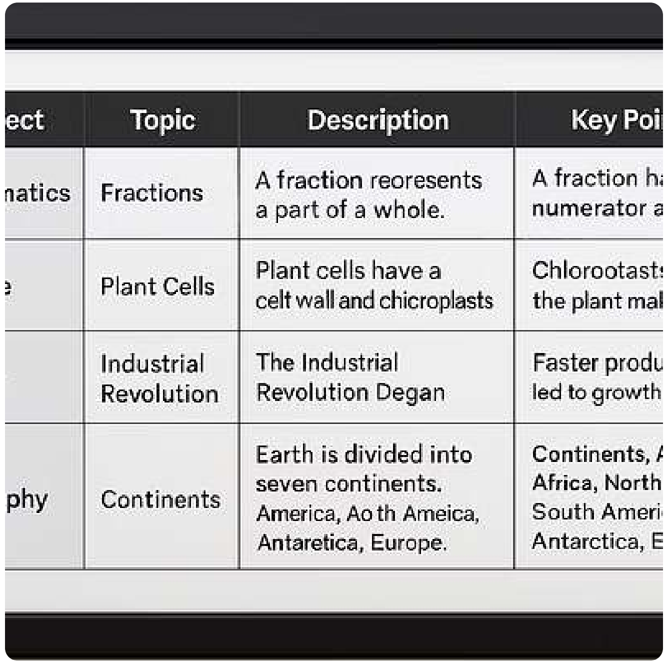
Avoiding Ambiguity in Prompts

Ambiguity is the enemy (and also in additional files content provided as context): Be explicit. Add constraints like word count, target audience, specific points to cover, or things to avoid. Use pre-processed external documents when needed.

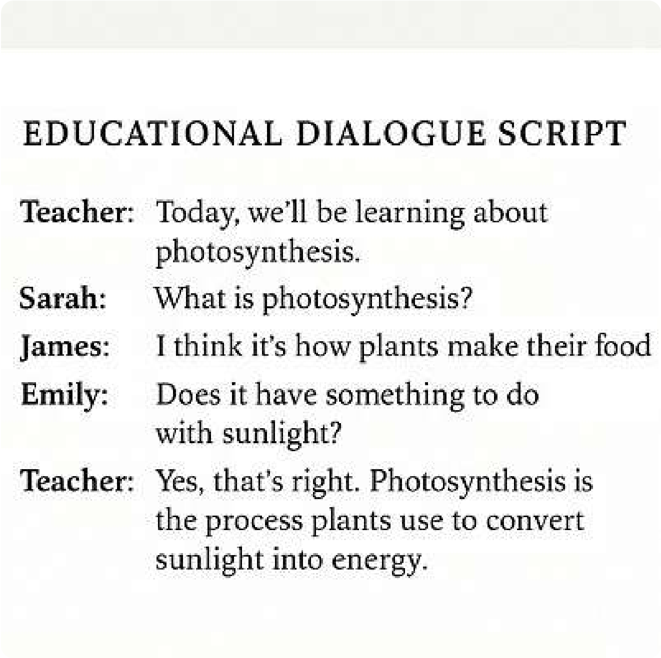
Ambiguous Prompt	Improved Prompt
"Write about climate and the change"	"Write a 300-word explanation of climate change causes for 7th graders, focusing on greenhouse gases and human activities. Use simple analogies and avoid political statements."
"Create a lesson, and also fractions"	"Create a 45-minute lesson plan on adding fractions with unlike denominators for 4th grade students. Include a warm-up activity, direct instruction, guided practice, and assessment."

Specifying Output Format

If you need the output in a particular structure, tell the AI. Use phrases like "Format the output as a JSON object", "Create a markdown table", "Provide a bulleted list", "Write the dialogue as a script with character names followed by their lines."



ect	Topic	Description	Key Poi
natics	Fractions	A fraction reoresents a part of a whole.	A fraction ha numerator a
e	Plant Cells	Plant cells have a celt wall and chicroplasts	Chlorootasts the plant mal
	Industrial Revolution	The Industrial Revolution Degan	Faster produ led to growth
phy	Continents	Earth is divided into seven continents. America, Ao th Ameica, Antaretica, Europe.	Continents, A Africa, North South Ameri Antarctica, E



EDUCATIONAL DIALOGUE SCRIPT

Teacher: Today, we'll be learning about photosynthesis.

Sarah: What is photosynthesis?

James: I think it's how plants make their food

Emily: Does it have something to do with sunlight?

Teacher: Yes, that's right. Photosynthesis is the process plants use to convert sunlight into energy.

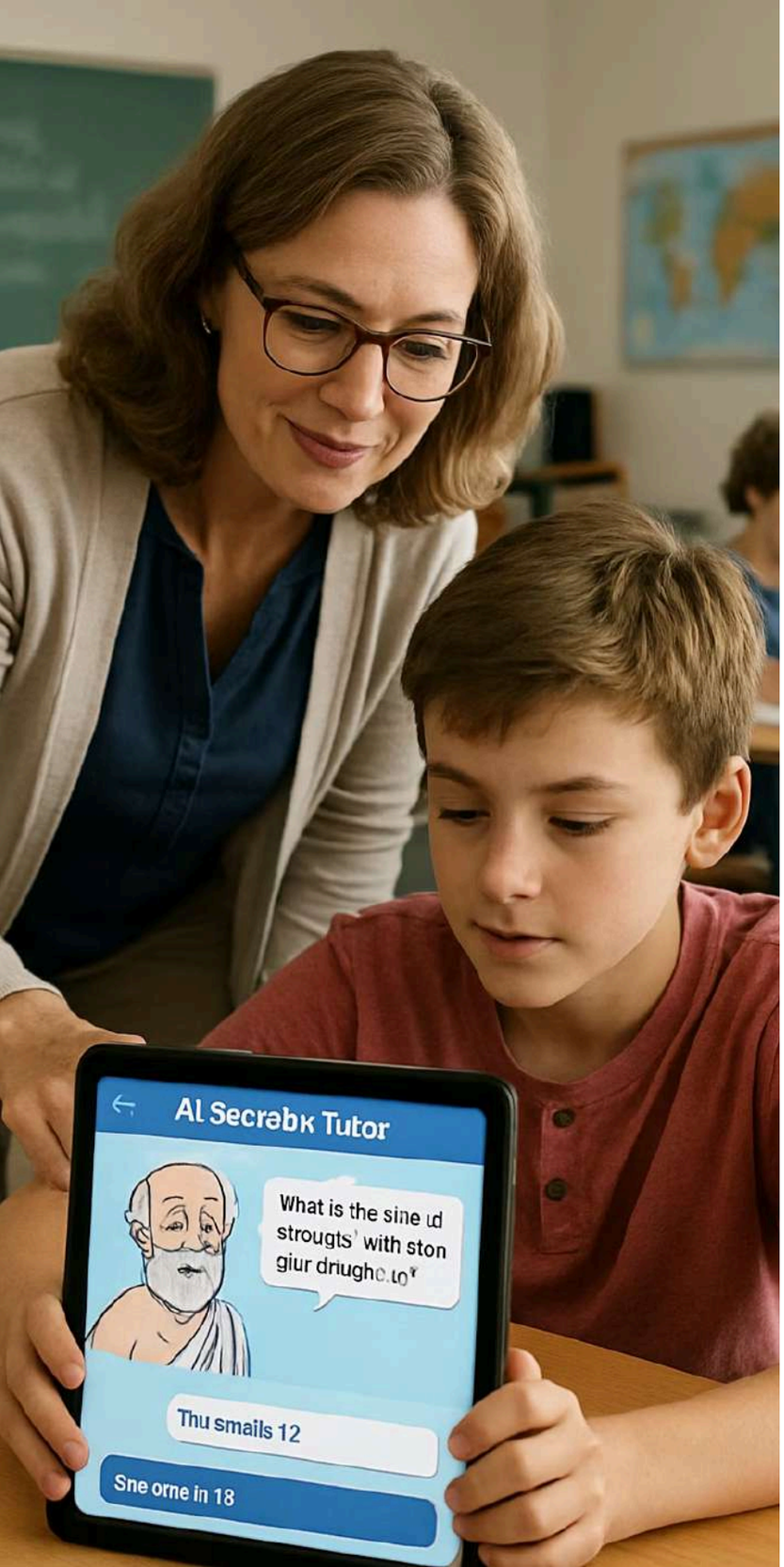
Advanced Techniques & Pedagogical Integration

While we focus on fundamentals today, integrating AI effectively often involves combining techniques and considering pedagogical approaches.

Chain-of-Thought (CoT) Prompting

Encourages the AI to explain its reasoning process before giving a final answer, especially for tasks requiring reasoning (like math problems or logic puzzles).

In standard LLMs (not new reasoning models) this means either put something like "Let's do it step by step", or provide 'extra intelligence' by defining in the prompt a very accurate list of steps that the LLM should follow (even some examples ala 'few-shot' learning)



AI as a Socratic Partner (Maieutics)

A powerful pedagogical application involves prompting the AI to act as a Socratic questioner. Instead of providing answers, the AI guides students through questioning to help them discover knowledge, refine their understanding, or explore different facets of a problem.

Initial Inquiry

Begin with open-ended questions that activate prior knowledge

Guided Exploration

Follow up with questions that help students discover key concepts

Connection Building

Ask questions that help students relate concepts to each other

Knowledge Construction

Guide students to formulate their own understanding and conclusions

AI Models as Ever-Present Teaching Assistants

The AI model, yes, always present in the classroom

Teacher/Student Inquiry

SPose questions or request assistance

AI Response

AI provides personalized, immediate support

Learning Integration

Insights are incorporated into the broader lesson

Teacher Guidance

Educator monitors and enhances the interaction

This real-time support can dramatically enhance understanding, engagement, and motivation while maintaining the teacher's central role in orchestrating the learning experience.

Instant Clarification & Explanation

Students encountering a difficult concept can ask the AI for an alternative explanation, an analogy, or a definition in simpler terms, receiving immediate support without waiting for the teacher.

Student Prompt Examples

- "Explain the concept of 'inertia' like I'm 10 years old."
- "I don't understand photosynthesis. Can you explain it using a simple analogy?"
- "What's the difference between weather and climate? I'm confused."
- "Can you explain mitosis in simpler words? The textbook is confusing me."

Educational Benefits

- Reduces wait time for assistance
- Provides multiple explanations of difficult concepts
- Adapts to individual learning preferences
- Allows students to seek help without peer judgment
- Frees teacher to help students with more complex needs

Generating Examples On Demand

When students need more examples to grasp a rule or concept (e.g., grammar rules, math procedures, scientific principles), the AI can generate them on demand.

Language Learning

Example Student Prompt: "Give me three more examples of sentences using the past perfect tense."

Mathematics

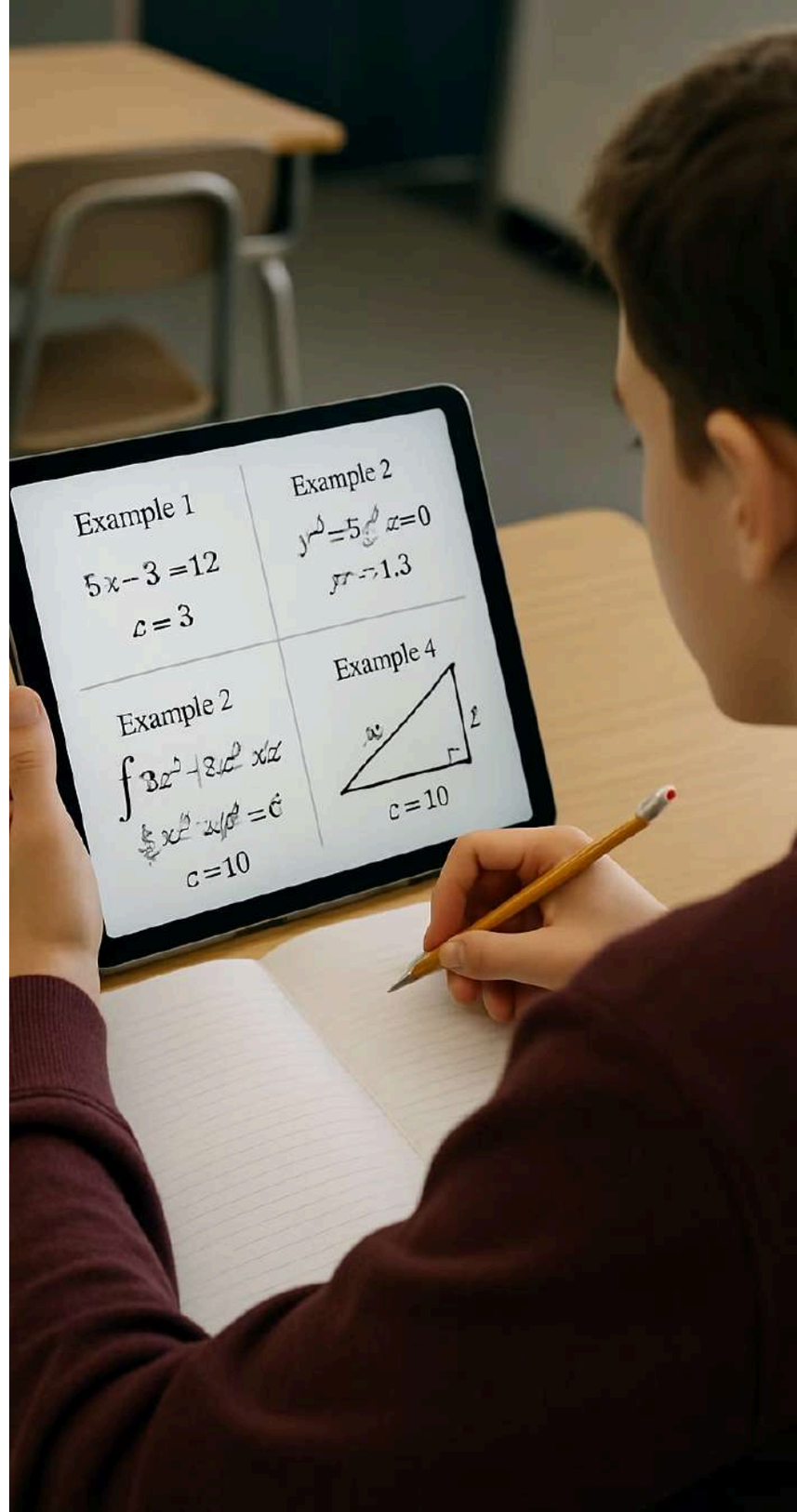
Example Student Prompt: "Show me different ways to solve this equation: 2x + 5 = 15."

Science Concepts

Example Student Prompt: "Give me three real-world examples of Newton's Third Law that I might see in everyday life."

Arts Education

Example Student Prompt: "Show me examples of how different composers have used minor keys to create mood."



Exploring Multiple Perspectives

AI can quickly present different viewpoints on a historical event, a scientific debate, or a literary interpretation, broadening student understanding.

Historical Perspectives

Example Student Prompt: "What were the main arguments for and against the Louisiana Purchase in 1803?"

This helps students understand historical events from multiple angles, recognizing that history is often complex and multifaceted rather than presenting a single narrative.

Scientific Debates

Example Student Prompt: "Explain the different scientific viewpoints on whether Pluto should be classified as a planet."

Students learn that scientific understanding evolves through debate and new evidence, helping them appreciate the dynamic nature of scientific knowledge.

Supporting Diverse Learners

AI can provide support tailored to individual needs, such as simplifying complex texts, translating vocabulary, or offering step-by-step guidance for problem-solving.

Language Support

AI can translate terms, explain idioms, or simplify text for English language learners, making content more accessible while they develop proficiency.

Learning Differences

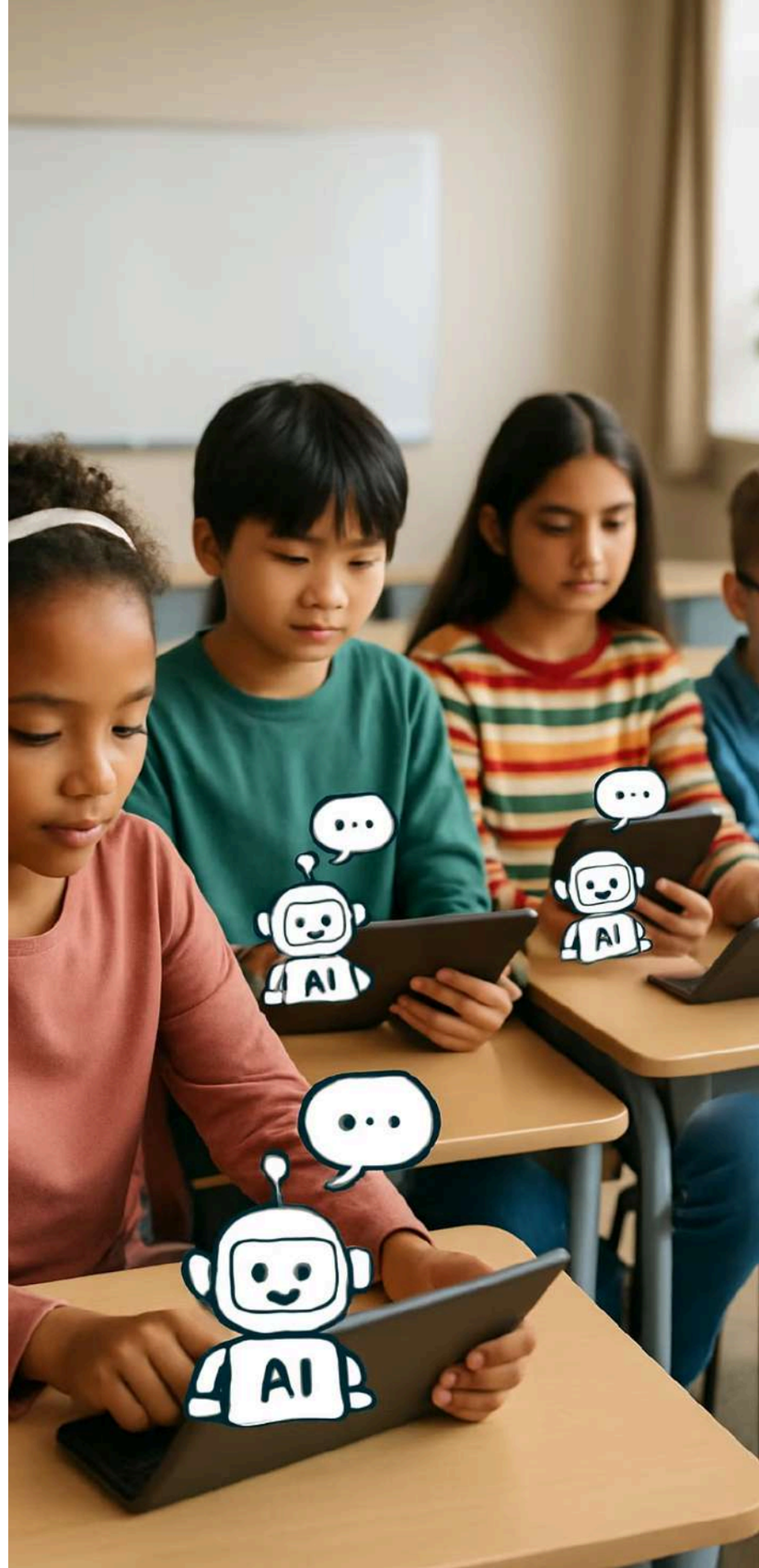
Students with different learning needs can request alternative explanations, visual representations, or step-by-step breakdowns of complex processes.

Pace Adjustment

Advanced learners can ask for deeper exploration of topics, while others can request additional reinforcement of fundamental concepts.

Multimodal Learning

AI can present information in different formats (text, visuals, analogies) to accommodate various learning preferences and strengths.



Sparking Curiosity and Deeper Learning

AI can answer follow-up questions instantly, encouraging students to go deeper into topics that pique their interest.

Initial Learning

Student encounters new concept in lesson or reading

Curiosity Sparked

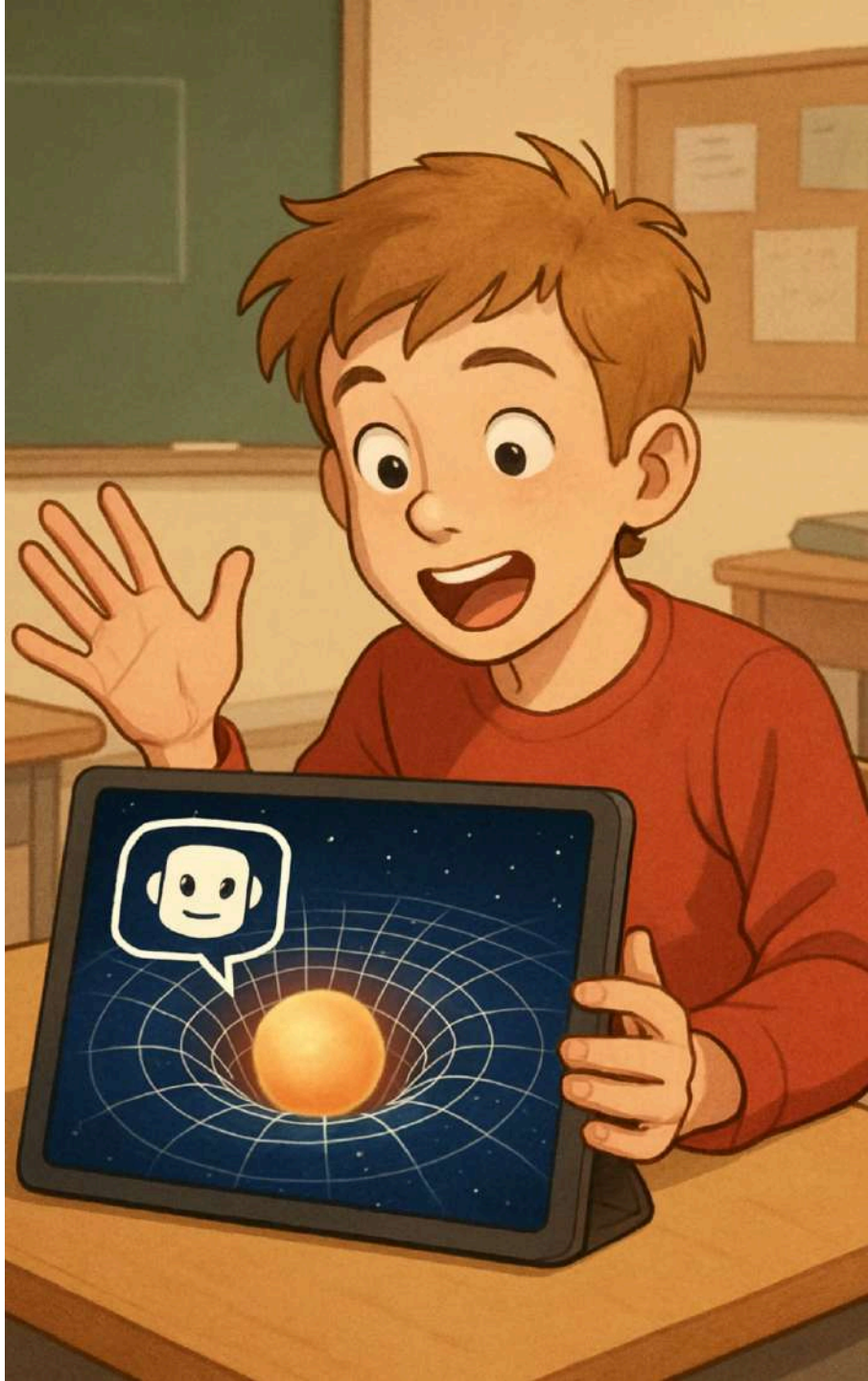
Student wonders about related aspects or implications

Exploration

Student asks AI follow-up questions to deepen understanding

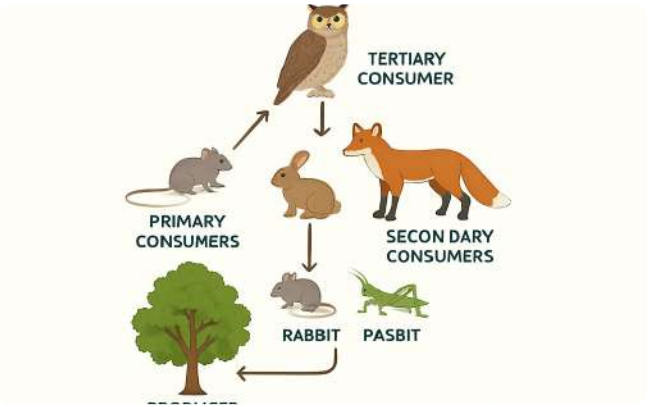
4 Connection Building

Student integrates new knowledge with existing understanding



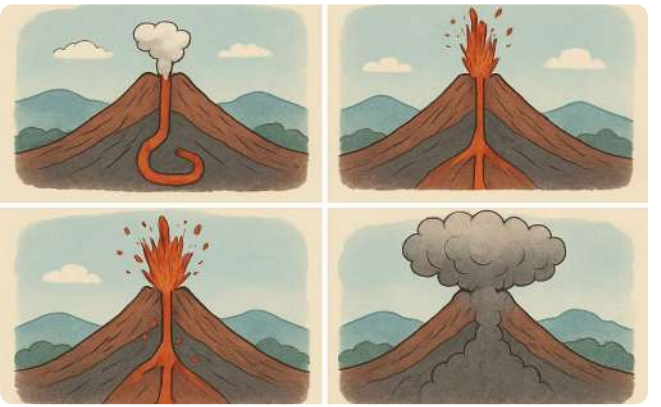
Multimodal Assistance in the Classroom

Beyond text, other AI tools can act as assistants for visualizing concepts, understanding processes, providing historical/cultural context, and sparking creativity.



Visualizing Concepts

Student prompt: "Generate a simple diagram showing the flow of energy through a food web in a forest ecosystem."



Understanding Processes

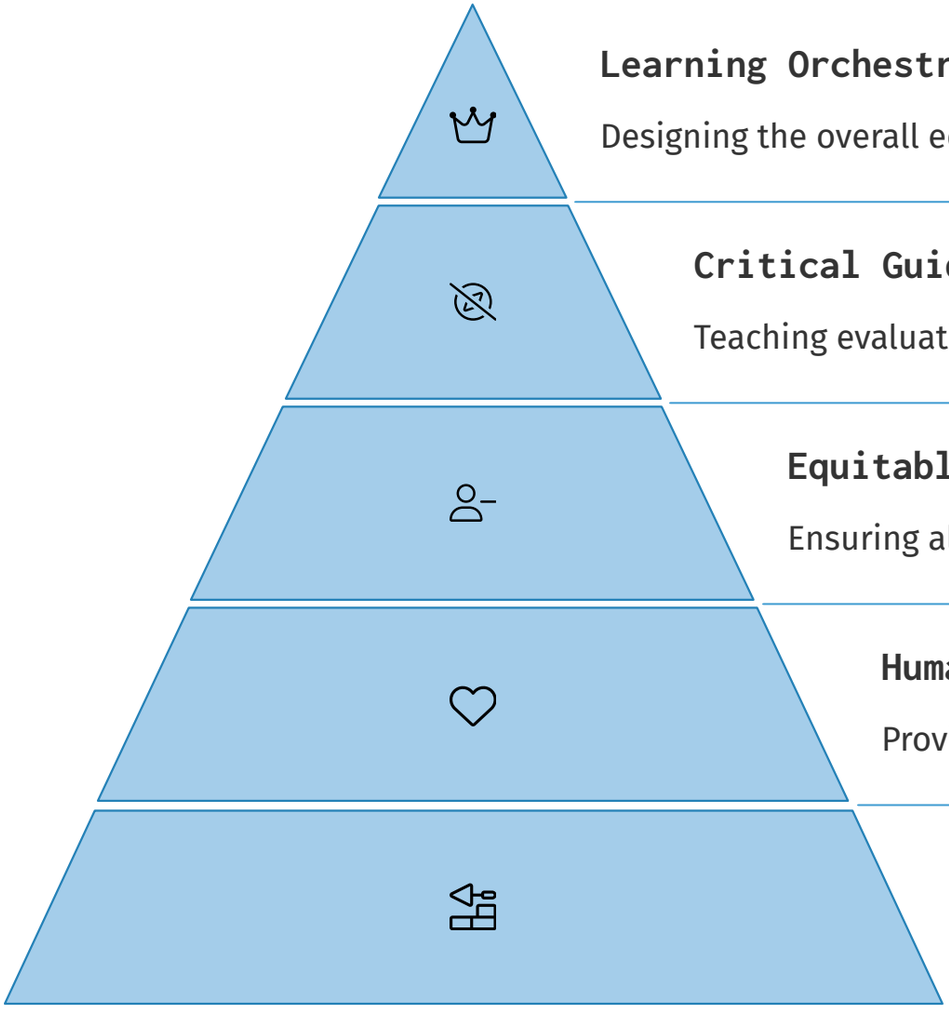
Student prompt: "Create a series of images illustrating the key stages of volcanic eruption."

Creative Spark

Teacher prompt: "Generate an image representing the theme of 'conflict' in a surreal art style. Let's discuss what we see."

The Teacher's Central Role in AI Integration

The teacher remains central, facilitating AI use, guiding prompt formulation, emphasizing critical evaluation of AI outputs, managing the classroom environment, ensuring equity, and orchestrating the overall learning experience.



Learning Orchestration

Designing the overall educational experience

Critical Guidance

Teaching evaluation of AI outputs and digital literacy

Equitable Access

Ensuring all students benefit from AI tools

Human Connection

Providing motivation, empathy, and mentorship

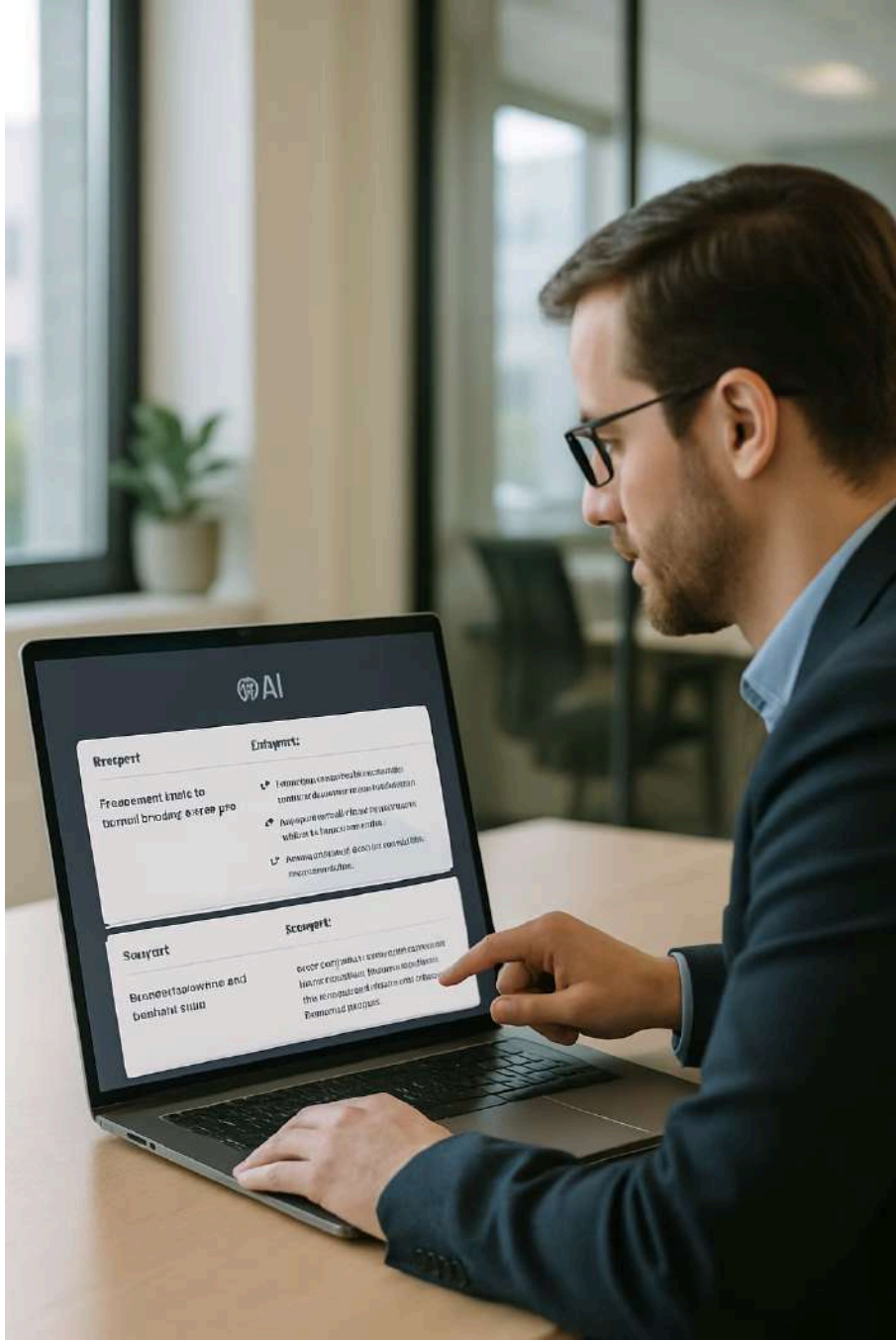
Technical Facilitation

Supporting effective AI tool use

Embracing AI as a real-time assistant can provide personalized support, foster curiosity, and enhance understanding, marking a significant evolution in educational practice.

Meta-Prompting: Enhancing AI Collaboration

Beyond directly telling AI what to do, you can leverage its capabilities at a higher level through Meta-Prompting – essentially, **prompting the AI about prompting itself or about the ideation process.** This approach transforms the AI into a collaborative partner from the very beginning of your task.



Why Use Meta-Prompting?

Overcome Blank Page Syndrome

If you're unsure where to start, ask the AI for suggestions to get your creative process flowing.

Refine Your Ideas

Get the AI to critique your initial thoughts or suggest improvements to strengthen your concepts.

Discover New Angles

The AI might suggest approaches or prompt structures you hadn't considered, expanding your creative horizons.

Optimize for AI

Ask the AI what information it needs to perform a task effectively, improving your results.

Educational Examples of Meta-Prompting

Content Creation (Lesson Planning)

"I need to create a 45-minute lesson plan for my students about the causes of the Cold War. What key information **do you need from me** to generate the most effective and engaging lesson plan possible, including learning objectives, activities, and assessment ideas?"

"**Suggest 5 different types of prompts** I could use to generate creative writing exercises based on historical photographs for my English class."

Critical Thinking Meta-Prompts

Social Media Analysis

"I want my students to critically analyze the impact of social media on society. What are some effective prompts you could give me (or them) to encourage deep thinking and consideration of multiple perspectives on this topic?"

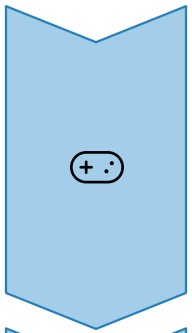
Logical Fallacies

"Generate 3 prompts designed to help students identify logical fallacies in news articles."

Debate Preparation

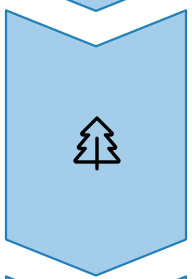
"What questions should I ask you to help me generate a debate activity comparing the pros and cons of renewable energy sources?"

Gamification and Game-Based Learning



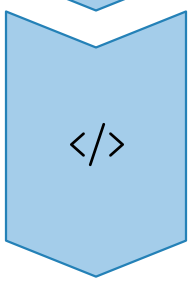
Spanish Vocabulary Game

"I want to create a simple educational game to help students practice Spanish vocabulary related to food. What information do you need from me to suggest 3 different game concepts, including core mechanics and learning objectives?"



Amazon Rainforest Adventure

"Suggest 5 prompts I could use to generate narrative scenarios for a choose-your-own-adventure game about exploring the Amazon rainforest, focusing on ecological concepts."



Coding Narrative Integration

"Suggest prompts that would help me brainstorm ways to integrate a compelling narrative storyline with the learning objectives for a game designed to teach basic coding concepts to beginners."

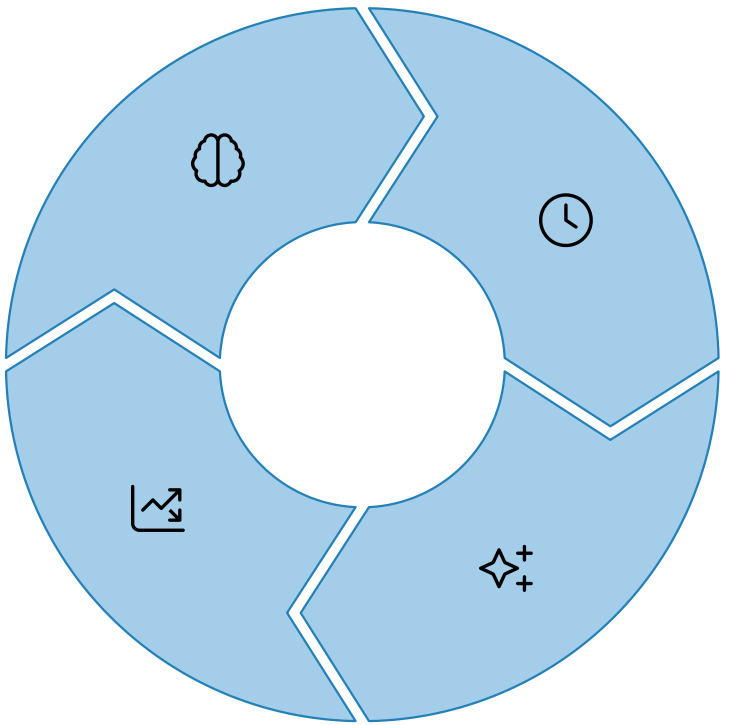
Benefits of Meta-Prompting

AI as Thinking Partner

Engage AI to help define and refine tasks, not just execute them

Improved Results

More effective use of AI through better-defined prompts and objectives



Time Efficiency

Save preparation time by leveraging AI's ability to generate ideas quickly

Creative Spark

Discover new approaches and perspectives you might not have considered

Iterative Prompting and Refinement

Start Simple

Begin with a basic prompt for your task. This gives you a foundation to build upon and helps identify areas that need improvement.

Analyze the Output

Evaluate the AI's response. Is it accurate? Is it in the right format? Does it meet all requirements? Identify specific areas for improvement.

Refine the Prompt

Based on your analysis, modify your prompt. Add more context, clarify instructions, provide examples, specify the format, or try a different technique like role prompting.

Repeat

Continue refining until you achieve the desired output quality and consistency. Don't be afraid to experiment with different approaches.

Ethical Considerations in AI Use

Accuracy and Hallucinations

AI models can generate incorrect or nonsensical information (hallucinations) that sounds plausible. Always fact-check AI-generated content, especially when using it for factual instruction. Use techniques like RAG or providing ground truth in the prompt to improve accuracy.

Bias

AI models are trained on vast datasets, which may contain societal biases. Be critical of AI outputs and check for biased language or perspectives. Prompt the AI to consider multiple viewpoints or avoid stereotypes.

More Ethical Considerations

Privacy and Data Security

Be cautious about inputting sensitive student information or confidential data into public AI tools. Understand the terms of service regarding data usage. Prefer tools designed with educational privacy standards in mind where possible.

Over-Reliance

AI should augment, not replace, critical thinking and pedagogical expertise. Use AI as a tool to support teaching and learning, not as a substitute for teacher judgment or student effort.

Authenticity and Academic Integrity

Establish clear guidelines with students about the appropriate use of AI tools for assignments, ensuring they understand the difference between using AI as a learning aid and submitting AI-generated work as their own.

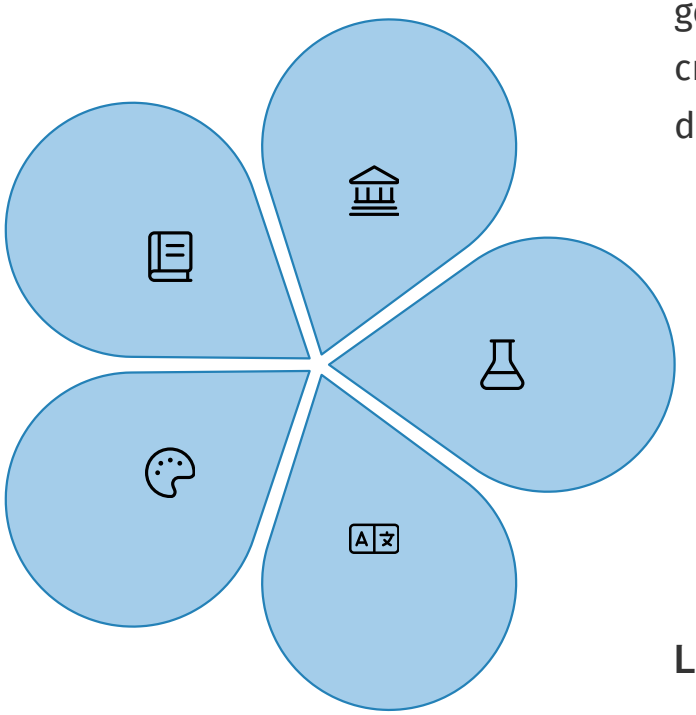
Prompting Across Disciplines

Literature

Generate character interpretations, create dialogue in author styles, brainstorm thematic connections, generate image prompts for key scenes

Arts

Brainstorm creative concepts, generate descriptive text for artworks, create prompts for image generators in specific styles



History

Simulate historical figure perspectives, generate counterfactual scenarios, create timelines, draft summaries for different reading levels

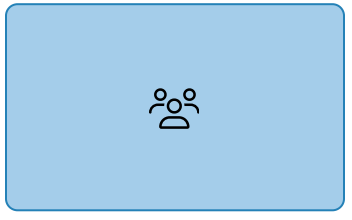
Science

Explain complex concepts using analogies, generate practice problems, outline experimental procedures, create pseudocode for simulations

Languages

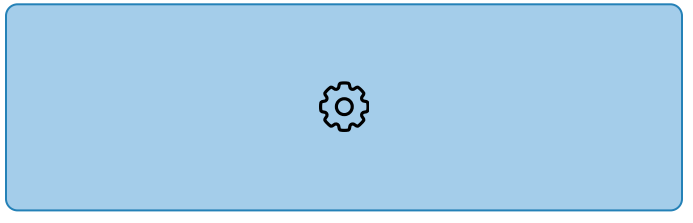
Generate practice dialogues, explain grammar rules with examples, create vocabulary lists with context sentences

Pedagogical Integration: Beyond Content Generation



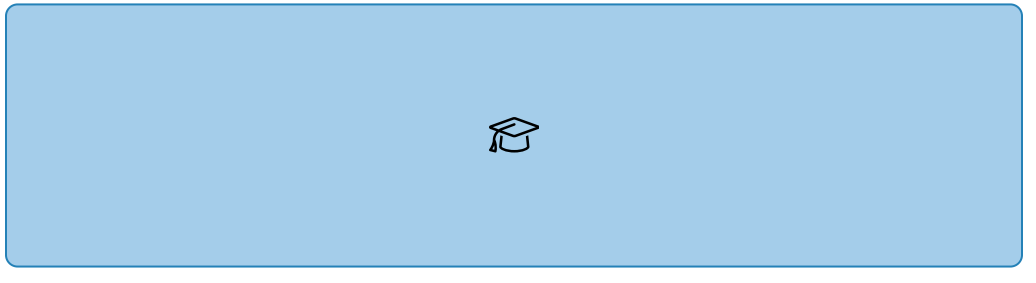
Empowering Students as Creators

Shift from teacher-created to student-designed learning experiences



Developing Tech Skills

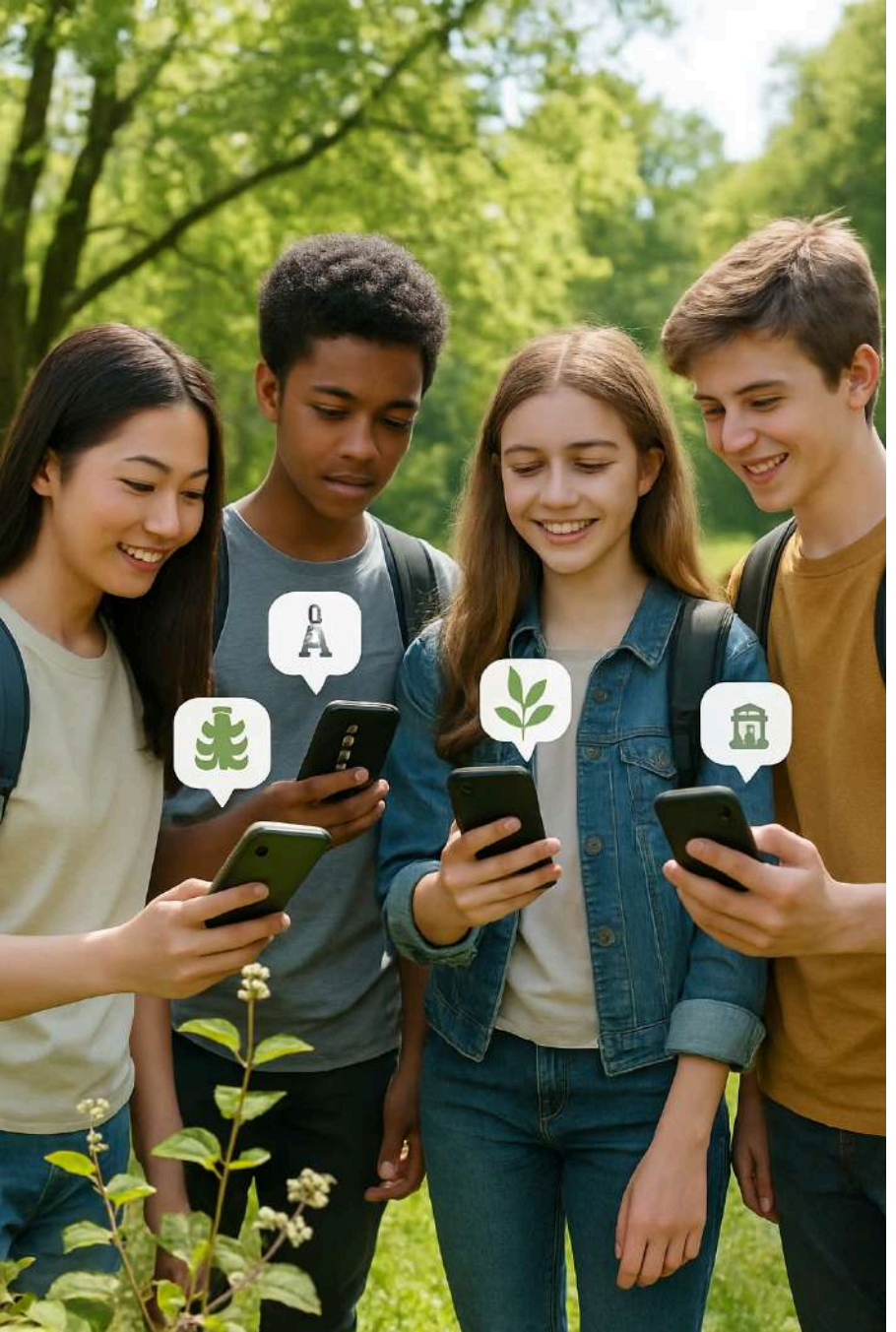
Foster AI literacy and design thinking through guided creation



Deeper Subject Mastery

Enhance understanding through the process of teaching others

Instead of you creating the game, how could students use AI tools (with your guidance) to design and build their own educational games or gamified experiences?



AI for Outdoor and Mobile Learning

Beyond the Classroom

Leverage the power of AI on mobile devices, combining camera input, voice interaction, and location awareness to create engaging outdoor or field-based learning experiences.

Real-World Connections

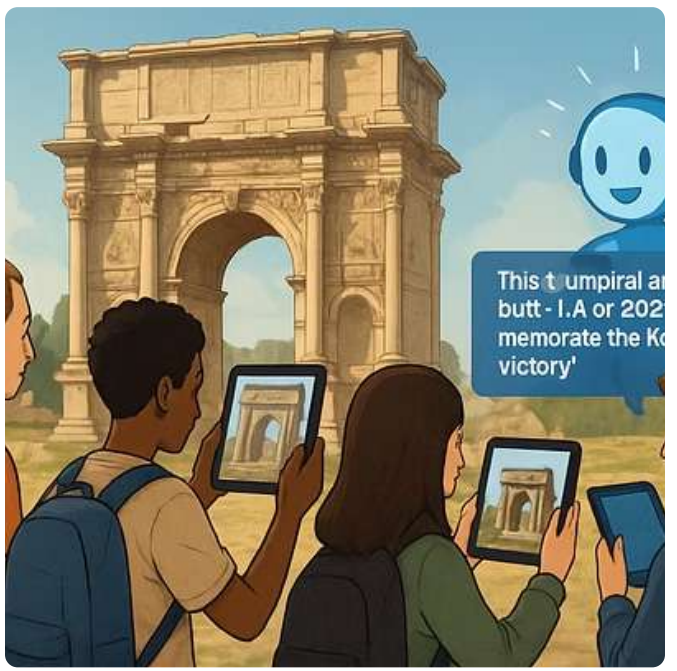
Takes learning beyond the classroom walls, connecting abstract concepts to the real world through interactive exploration.

Experiential Learning

Encourages hands-on discovery and observation, making learning more memorable and engaging for students of all ages.

Camera & Voice for Discovery Learning

Mobile AI can transform the environment into an interactive learning space. Students can use the camera to identify objects (plants, landmarks, artworks, machinery) and receive information, challenges, or narrative prompts via voice or text. Voice input allows for hands-free interaction during field activities.



This approach creates immersive learning experiences that connect digital information with physical exploration, making abstract concepts more concrete and memorable.

Mobile AI Learning Examples

Biology Nature Walk

Students photograph plants/insects. AI identifies them using image recognition, provides facts, and poses challenge questions related to the local ecosystem.

History/Architecture Tour

A city tour where students photograph architectural features. AI identifies the style, provides historical context, and asks students to find other examples nearby.

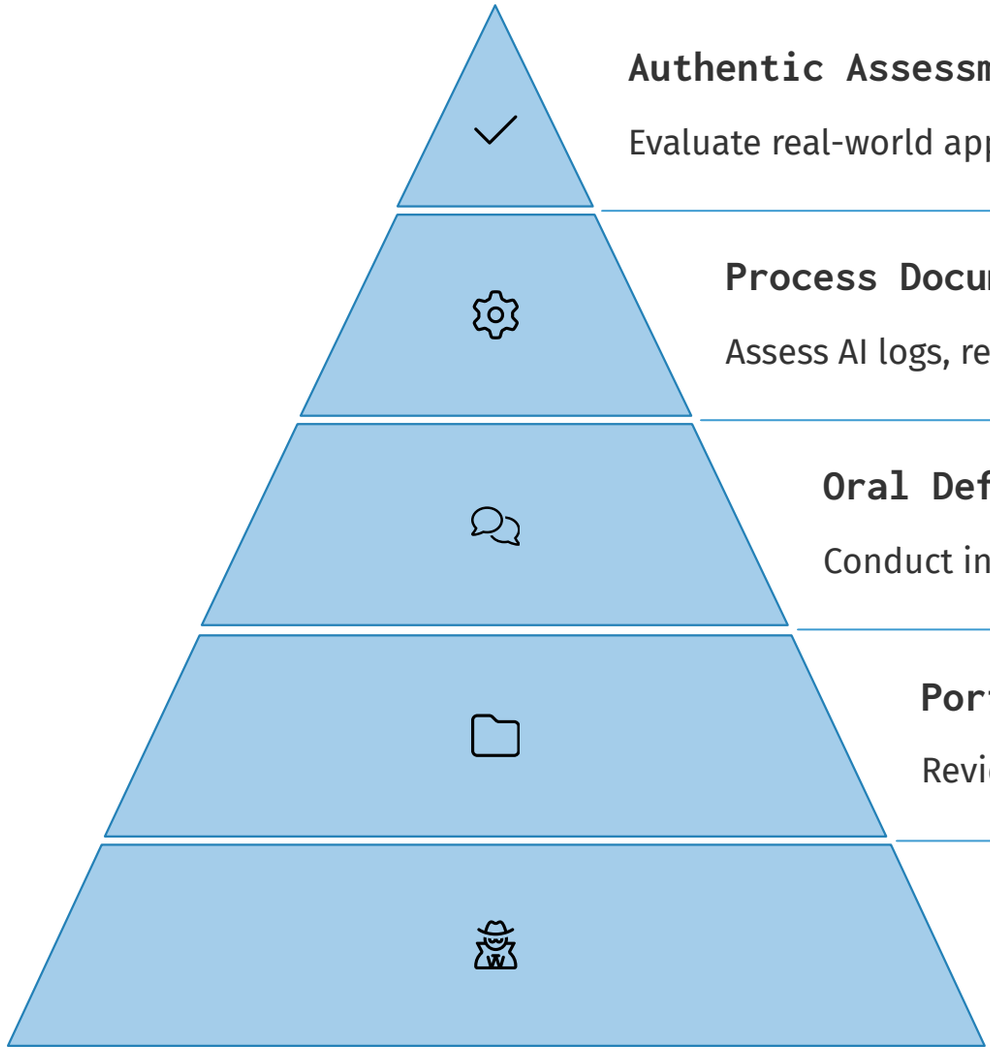
Museum Art Experience

Students photograph artworks. AI provides information about the artist, period, and technique, and prompts students with analytical or reflective questions.

Language Scavenger Hunt

Students find objects and ask the AI (in the target language via voice) "What is this?" or "Describe this object," receiving responses and related vocabulary.

Assessing AI-Augmented Student Work



Authentic Assessment

Evaluate real-world application and creative problem-solving

Process Documentation

Assess AI logs, reflections, and iteration history

Oral Defense

Conduct interviews to verify understanding

Portfolio Assessment

Review collection of work showing growth over time

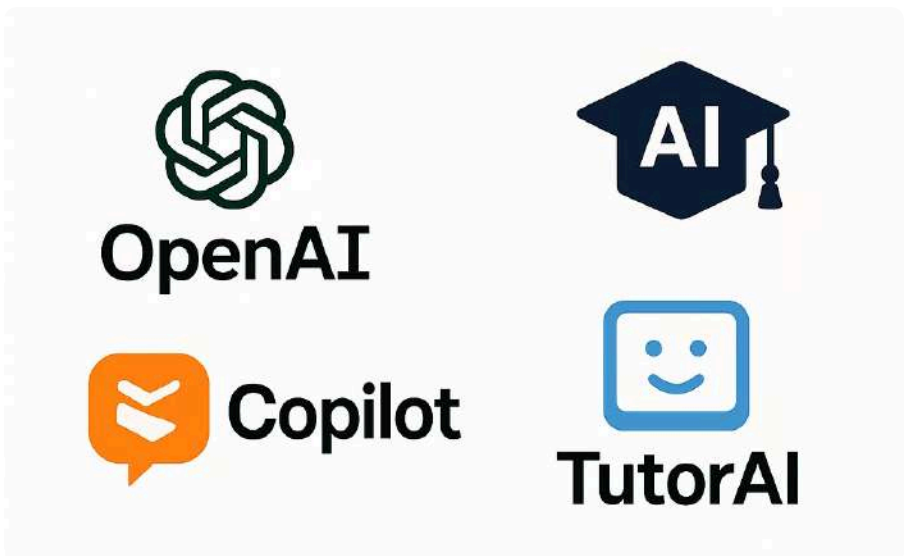
Peer Review

Incorporate structured feedback from classmates

When students use AI in their work, shift your assessment focus from the final product to the process and competencies demonstrated. Evaluate their prompt engineering skills, critical evaluation of AI outputs, and ethical use of AI assistance.

'Free' AI Tools for Educators

This section provides a curated list of free or freemium AI tools that educators can leverage for creating engaging educational content, including assets for games and interactive experiences. Features and free tier limitations are subject to change, so it's always best to check the tool's website for the latest information.

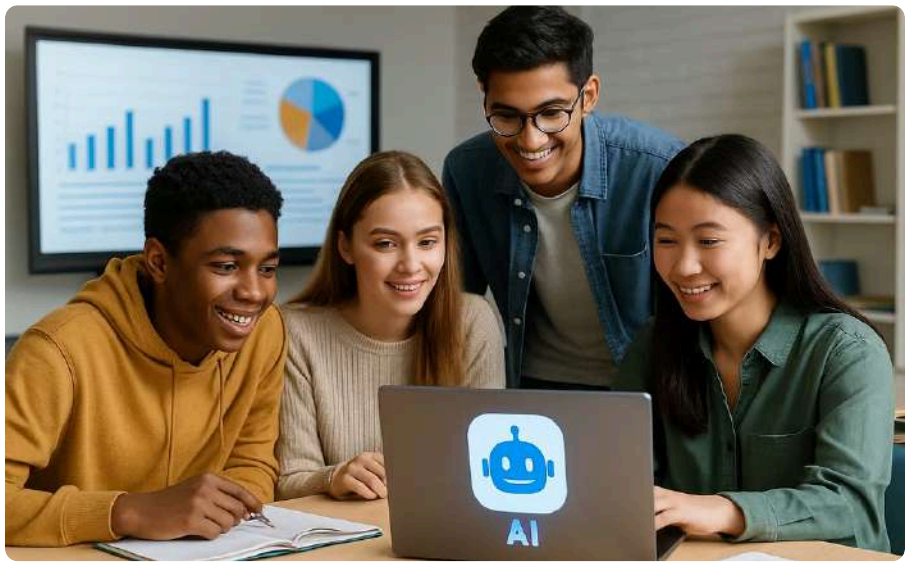


Available Resources

Many AI tools offer free tiers specifically designed for educational use, making advanced technology accessible to teachers and students regardless of budget constraints.

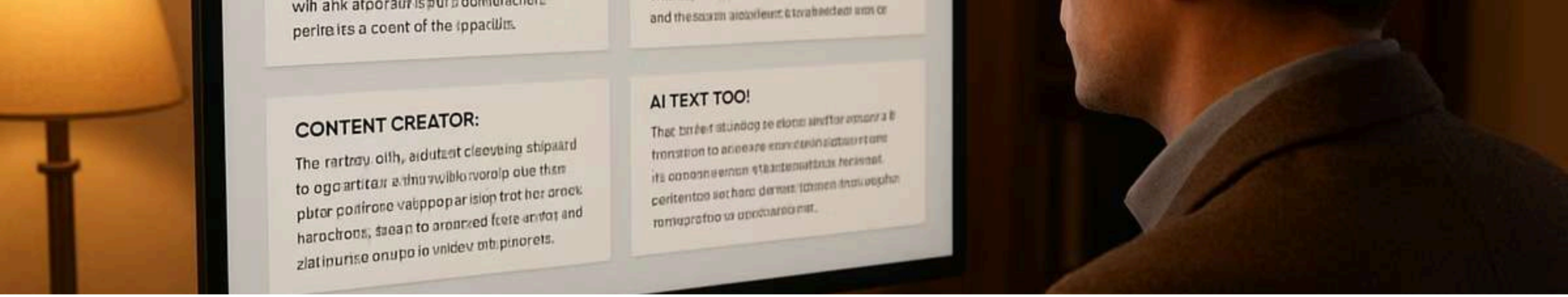
Practical Applications

These tools can help create lesson materials, generate practice exercises, develop visual assets, and design interactive experiences that enhance student engagement and learning outcomes.



Student Engagement

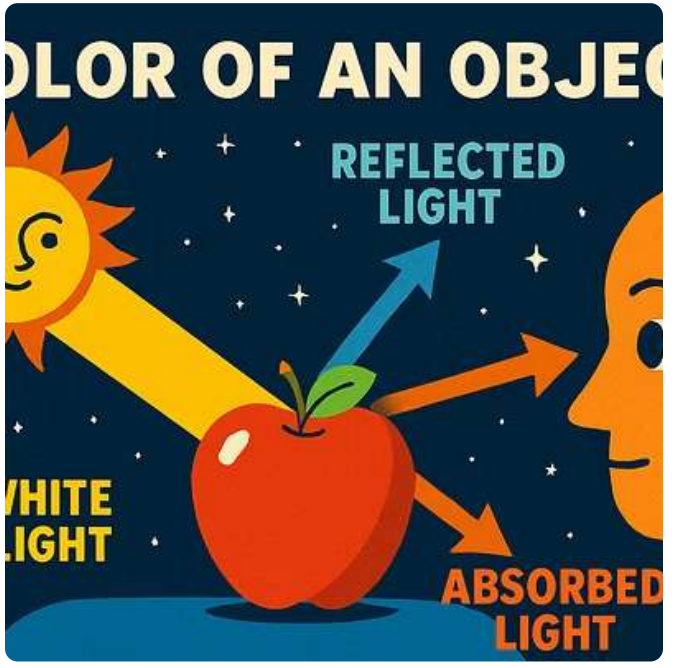
When properly integrated, AI tools can significantly increase student motivation and participation by creating more personalized and interactive learning experiences.



Text Generation Tools

Tool	Key Features	URL
ChatGPT (OpenAI)	Versatile conversational AI capable of various text generation tasks. Offers a powerful free tier.	https://chat.openai.com/
Google Gemini	Google's conversational AI, integrated with Google Workspace. Offers a robust free version.	https://gemini.google.com/
Claude	Strong conversational AI known for its writing capabilities and larger context window in its free tier.	https://claude.ai/
Microsoft Copilot	Integrated into Windows and Edge, offering text generation based on OpenAI models. Free to use.	https://copilot.microsoft.com/
Grammarly AI	Known for grammar checking, now includes generative AI features for writing assistance.	https://www.grammarly.com/ai/ai-writing-tools

Image Generation Tools



These tools can create illustrations, character sprites, backgrounds, concept art, and other visual assets for educational materials and games based on text prompts. Popular options include **Freepik**, **Recraft**, **leonardo.ai**, as well as image generation capabilities in multimodal AI systems like **Qwen**, **Mistral**, **ChatGPT**, and **Gemini**.

Music Generation Tools

Udio

Can generate music with vocals based on text prompts.

URL: https://www.udio.com/

Perfect for creating background music for educational videos or presentations that require specific moods or themes.

Suno AI

Creates songs (including vocals) from text prompts. Offers a free tier with daily credits.

URL: https://suno.ai/

Ideal for developing custom songs for educational games, language learning exercises, or subject-specific content that benefits from musical elements.

Video and 3D Generation Tools

Emerging Technology

Video and 3D generation with AI is still rapidly developing, with new capabilities emerging regularly

Key Players

RunwayML, Sora, Pika Labs, and Luma AI lead in accessible AI video and 3D generation

Collaborative Workshop Overview

Form Groups

Join colleagues based on teaching domain

Select Challenge

Choose a prompt that resonates with your group

Brainstorm & Design

Discuss objectives, audience, and mechanics

Generate Content

Use AI tools to create necessary materials

In this collaborative session, you will work in domain-based groups to apply **prompt engineering techniques**. Your task is to select one of the challenges and use **common AI tools** to brainstorm, design, and **create ideas and/or strategies of an AI-enhanced educational learning experience** or **an assignment they can do at home with common AI tools with no problems regarding cheating**.

Workshop Objectives

Gamify a Course

Prepare everything needed to gamify a course using widely available AI tools.

Enable Student AI Use

Define a strategy to give students the possibility of using AI models to accomplish **learning goals, new experiences, innovative assignments**, including guidance on tools and example prompts.

Develop Critical Thinking

Gamify critical thinking by having students make decisions about AI models and prompts.

Use your imagination (or let AI help you;)

Using ChatGPT, Gemini, etc. what innovative learning experience at classroom, as an assignment, etc. can students undertake? How you will evaluate their work?

Literature: Interactive Fiction - "Pride and Prejudice"

Let students to explore key moments in "Pride and Prejudice" from different perspectives, making a new approach and critical view of this novel.

AI Tools Used

- Text generation (ChatGPT, Gemini, Claude)
- Image generation for visual elements
- Potentially music generation for period-appropriate background

Educational Benefits

- Deeper character understanding
- Exploration of social context
- Critical analysis of narrative perspectives
- Engagement with classic literature through modern medium

Generating Character Perspectives

> Act as Mr. Darcy from Jane Austen's "Pride and Prejudice" shortly after the first ball at Meryton. Write a short, private reflection (approx. 100 words) on his impressions of the local society, particularly Elizabeth Bennet. Capture his initial pride, disdain for the country manners, but also a hint of intrigue regarding Elizabeth.

This prompt helps students understand character voice, internal conflict, and social context. By generating perspectives from different characters, students can compare viewpoints and analyze how the same events are perceived differently based on social position, personality, and biases.

After reading the AI-generated perspective, students can evaluate whether they agree with this interpretation based on their own reading of the novel, encouraging critical analysis and textual evidence. **Or, the other way around and open a debate!**

Generating Image Prompt for a Setting

> Generate a detailed image prompt for an AI image generator to create a visual representation of the Netherfield Ball scene from "Pride and Prejudice". Focus on the atmosphere and the elements of that period.

This prompt helps students visualize the setting and social dynamics described in the text. Creating visual representations of literary scenes can enhance understanding of historical context, social hierarchies, and non-verbal character interactions.

Students can evaluate whether the generated image accurately represents their mental image from reading the text, encouraging close reading and attention to descriptive details.

Students can generate an illustrated version of the novel?

History: Simulating Decision-Making - Cuban Missile Crisis

Create materials for a simulation where students grapple with the decisions faced by leaders during the Cuban Missile Crisis, perfect for classroom implementation.

Generating Advisor Briefings

Create contrasting perspectives from Hawkish and Dovish advisors to President Kennedy, presenting different strategic options and their potential consequences.

Simulating Consequences

Generate plausible outcomes for different student decisions, based on historical analysis and counterfactual reasoning.

Creating "Primary Sources"

Develop fictional but historically plausible diary entries, memos, or other documents to provide immersive context.

Visualizing Historical Moments

Generate image prompts to create visual representations of key scenes and settings from the crisis.

Generating Potential Consequences

> In a historical simulation of the Cuban Missile Crisis playing as President Kennedy, choose the option: "Authorize a full-scale military invasion of Cuba combined with air strikes." Based on historical analysis, generate a plausible, dramatic short-term consequence narrative (approx. 150 words) describing the immediate aftermath and Soviet reaction. Emphasize the high risk of escalation.

This prompt allows students to explore counterfactual history based on plausible outcomes, understanding the gravity of historical decisions. By seeing the potential consequences of different choices, students develop a deeper appreciation for the high-stakes nature of Cold War diplomacy.

The simulation encourages critical thinking about cause and effect in history, helping students understand that historical events weren't inevitable but resulted from specific decisions made under pressure.

Language Learning: Interactive Dialogue Practice

Create elements for an interactive scenario where language learners (e.g., beginner **Spanish**) practice **ordering food in a restaurant**.

AI tools can generate all the components needed for an effective language learning scenario, from **realistic dialogue scripts to contextual vocabulary, grammar explanations, and visual prompts**. This creates a comprehensive learning experience that addresses multiple aspects of language acquisition.

Generating Dialogue Simulator with Role Prompting

> Let's create a dialogue simulator in order to improve my Spanish. Act as a friendly waiter in a Spanish restaurant interacting with a beginner-level Spanish language learner (me). My goal is to order food and achieve to be understandable in Spanish. You start as the waiter greeting the me and asking if I'm are ready to order. You act as a nice waiter, but only able to speak Spanish, so if I'm not able to express properly react acting as an actual Spanish waiter trying, in Spanish, to be more understandable. The dialogue finishes successfully if I manage to order at least one food item and one drink.

This prompt provides realistic dialogue practice in a common scenario, incorporates vocabulary learning, and models helpful interaction. **Role-based dialogues** help language learners practice authentic communication in contextually appropriate situations.

Generating Vocabulary Flashcard Content

La ensalada

English: Salad

Sentence: Me gustaría ordenar una ensalada, por favor. (I would like to order a salad, please.)

El agua

English: Water

Sentence: ¿Me trae un vaso de agua, por favor? (Can I have a glass of water, please?)

La paella

English: Paella

Sentence: La paella es un plato tradicional español. (Paella is a traditional Spanish dish.)

Students can create these vocabulary flashcards combining visual elements with contextual sentences to enhance language learning through multiple modalities.