Evaluating AI Output

Target Grade: 6th – 12th grade

Time Required: Two 60-minute class periods

Standards

ISTE Standards for Students

- Innovative Designer: Students use a variety of technologies within a design process to identify and solve problems by creating new, useful, or imaginative solutions.
- Knowledge Constructor: Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts, and make meaningful learning experiences for themselves and others.

Common Core State Standards (CCSS)

- CCSS.ELA-Literacy.W.6-8.6: Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

Lesson Objectives

Students will:

- Identify the capabilities and limitations of AI language models such as ChatGPT, CoPilot, and Gemini.
- Use ChatGPT to generate a draft for a creative or informational product.
- Edit and refine the AI-generated content to meet specific criteria and improve quality.
- Reflect on the process and outcomes of using AI in the creative process.

Central Focus

This lesson centers on the critical evaluation and refinement of AI-generated content, empowering students to explore the capabilities and limitations of AI language models like ChatGPT. Through hands-on activities, collaborative discussions, and independent editing workshops, students will learn to craft effective prompts, analyze AI outputs, and enhance their writing through human editing and oversight. By engaging in this process, students will develop valuable digital literacy skills, understand the importance of human creativity in the AI-assisted writing process, and reflect on the use of technology in content creation.

Key terms: AI literacy, prompt engineering, digital collaboration, editing techniques, human-AI interaction, content refinement, peer feedback

Note on Digital Citizenship and Responsible AI Use

As AI tools become more common in education and everyday life, it's important for both teachers and students to understand responsible and ethical use of these technologies. Teachers should guide students in practicing good digital citizenship by discussing topics such as:

- **Privacy and Security:** Remind students never to share personal information or sensitive data when using AI chatbots or any online tools.
- **Intellectual Property:** Encourage students to use AI-generated content as a starting point and to credit original sources when applicable. They should also learn to critically evaluate AI outputs rather than accepting them blindly.
- **Ethical Use:** Teach students to consider the fairness and biases in AI responses and the impact of their prompts and generated content. This awareness supports responsible AI interaction and thoughtful technology use.
- **Transparency:** Encourage honesty about when AI has been used in their work, helping build integrity and trust in digital spaces.

For teachers, modeling responsible AI use and incorporating discussions around these topics throughout the lesson helps students develop critical thinking skills and a healthy relationship with emerging technologies. Integrating digital citizenship with AI prepares students not only to be creators but also thoughtful users of AI tools in their academic and personal lives.

Materials

- Computers or tablets with internet access
- Access to ChatGPT or similar AI language model platforms
- Lesson slideshow
- Editing AI practice essay (use one of these or make your own!)
- Project record sheet
- Scoring rubric

Instruction

Day 1

Introduction to AI (5 minutes)

- Students enter the classroom and jumpstart their thinking by writing answers to the bell-ringer questions:
    - What are some examples of Artificial Intelligence (AI) that you've used or seen in your daily life?
    - What do you think that AI can do well?
    - What might it struggle with?

- Building on the bell-ringer questions, begin with a short discussion on artificial intelligence (AI) and its applications in everyday life. Hopefully students will identify examples such as voice assistants (e.g., Siri or Alexa), recommendation systems (e.g., Netflix or Spotify), and chatbots.
- Talk about the limitations of AI and generating information. AI can generate text quickly, but it might struggle with creativity or understanding context like humans do.
- Explain that ChatGPT is an AI model designed to generate text based on prompts and that students will use it to create and edit a product.
- Review the learning objectives and briefly explain how they align with real-world skills.

Demonstration and Practice (20 minutes)

- Demonstrate how to use ChatGPT by projecting it on a screen (or guiding students through their own devices).
- Show how to write a clear and detailed prompt. For example:
    - **Weak Prompt:** Write a story.
    - **Strong Prompt:** Write a 5-paragraph story about a young astronaut who gets stranded on Mars and discovers a hidden underground city.
- Open ChatGPT in two separate browsers. Generate a sample response for both the weak and strong prompts and discuss their differences.
- Ask what makes a good prompt for ChatGPT?
    - Potential answer: A good prompt is specific, detailed, and provides context or constraints for the AI to follow.
- Show how additional input into AI can modify the story. Choose something specific about the story and type a prompt to have it changed. The following are examples and yours may be different based on the story your prompt generates.
    - Change the cause of the astronaut being stranded.
    - Add a paragraph that gives details about the Martian life.
    - Add scientifically accurate facts about the surface of Mars.
- Ask, what can we do if the AI generates something that doesn't make sense or isn't what we wanted?
    - Potential answers:
        - Refine the prompt and ask it to generate again.
        - Respond back to ChatGPT conversationally and ask it to revise its response.
- Further analyze the strengths and weaknesses of the product from the strong prompt.
    - Focus on the types of things that you'd want students to revise if this were their own product.
        - Clarity – is it easy to understand? Reorganize if needed. Rewrite complex sentences.
        - Accuracy – If relevant, is it factual? Ask it to provide citations for factual information.
        - Relevance – Did it actually write what you meant for it to write? Or did it go off topic?

    - Formatting and Structure – AI is a computer program, so it often uses a pattern that may not be suitable for your purpose. Change the formatting (bullets or not, add or remove headers, add or remove paragraph breaks, etc).
    - Human Touch – Does it sound like you? If not, reword it! Sometimes it will add a joke you'd never say. Change it or remove it. This is still YOUR product.
- Address any questions students have about interacting with ChatGPT.

Independent Editing Practice (10 minutes)

- Explain to students that they will have the opportunity to suggest edits to another AI-generated document.
- Pass out one of the Editing AI Practice Essays.
    - ***Note to teacher:*** *There are three sample essays with suggested student edits provided with this lesson. You could also generate one yourself that aligns with your topic area.*
- Allow students about 5 minutes to read the essay and mark it up as the editor. Students should write their suggested edits to the document directly on the essay.
- Spend about 5 minutes discussing suggested edits as a class and providing guidance on the quality of suggested edits.

Project Briefing (10 minutes)

- Explain the project guidelines and rubric.
    - ***Note to teacher****: This is a place for you to insert your own guidance into what types of projects you want them to do. Based on your subject area and other goals for the class outside of learning to use AI as a thought partner, you may have specific topics or types of writing you want them to do. Edit the slideshow as needed to align with your goals for the project.*
    - Use the Project Briefing slide to explain what they will do for the rest of today and tomorrow.
        - Develop and use a prompt
        - Refine the AI output with additional prompts
        - Edit the content
        - Share
        - Reflect
- Show the project record sheet.
    - ***Note to teacher:*** *The project record sheet was designed for students to access a digital version and copy/paste their outputs into the sheet.*
    - *Because each group will record 3 versions of their product, it is recommended that you limit the assignment to 3 or 5 paragraphs.*
- Remind students that they should never input personal information or data into an AI tool.
    - Do not share: your address, social security number, parent's information, or any other identifying information.

- The type of product the students develop will vary depending on the goals for the lesson. Several ideas can be found at the end of this lesson plan.
- Provide examples of potential prompts. These will vary depending on your class and your goals for the lesson.
- Divide students into small groups.

Group Brainstorming (10 minutes)

- Instruct the student groups to brainstorm and decide on their project's theme or topic.
- Circulate among the groups to provide guidance and answer questions.
- Ask questions as needed to help students develop their prompts.
    - How can you make the prompt more specific?
    - What is the main goal of your prompt? Is it clear enough for the AI to produce the result you are looking for?
    - Have you included enough detail in your prompt?
    - Have you included guidance on the output? Do you want a novel or a few paragraphs?
- Each group should develop a detailed and specific prompt.
- Review prompts and provide approval before students enter them into ChatGPT tomorrow.

Closing (5 minutes)

- Answer written closing questions and follow with a short discussion, if time allows.
    - What challenges did you encounter when trying to develop a prompt for ChatGPT?
    - What concerns do you have about using your prompt tomorrow?
    - What did you like about experiencing ChatGPT as a writing tool?
    - What do you not like about the possibility of using ChatGPT as a writing tool?

Day 2

Introduction (5 minutes)

- Begin by opening the project record sheet that was used yesterday.
- Instruct students to find the prompt that their group developed yesterday and answer the following questions:
    1. Do you think this prompt will provide the result you intend?
    2. Are there changes that you'd like to include before you use it today?

Content Generation (10 minutes)

- Instruct students to move back into their groups from yesterday, retrieve the prompt they developed, and use it to generate a draft with ChatGPT.
    - Students will not need to log in to ChatGPT.
- Instruct students to copy the original AI output into their project record sheet.

- Students should conduct an initial review and discussion within groups on the generated content.
    - Does AI's response match the style and tone you want?
    - What parts of the response could be improved?
    - Is the response accurate?
- Students can refine their prompt and generate a new draft as many times as the timer allows. They should record notes on the additional prompts they used with ChatGPT.
- Instruct students to copy and paste their "final" AI output draft into their project record sheet and close ChatGPT.

Editing Workshop (20 minutes)

- Keep a copy of the "final" AI output in your project record sheet. Copy it into the "final draft with human edits" section and use that copy for the editing workshop.
- Without additional use of an AI tool, groups work together to edit and refine their drafts based on the editing checklist.

Sharing (20 minutes)

- Organize students into pairs of groups.
- Instruct students to follow this process to share their projects:
    - Group 1: Share your edited product with another group. Use your project record sheet to explain your prompt, the AI's initial output, and the changes you made.
    - Group 2: Give your thoughts and feedback on Group 1's final product and process of getting to it.
    - Swap roles and allow Group 2 to share their product while Group 1 provides feedback.
    - Discuss the process of editing the AI output and the similarities and differences between your project and the other group's project.
- If time permits, shuffle group pairings and have a second round of sharing.

Closing (5 minutes)

- Reflect on the process of using AI for content creation through the written closing questions.
    - What did you learn about the strengths and limitations of using AI tools like ChatGPT for creating and editing content? How did this shape the way you approached the project?
    - How did the process of editing the AI-generated content improve the final product? What revisions made the biggest difference and why?
    - What role did collaboration play in your project? How did working with others help you improve your ideas or understand the task better?
- Remind students that while they have learned a strategy for using AI tools today, they should always check with their teacher before using an AI tool on an assignment and find out if their teacher requires disclosure of AI-assistance on a written assignment.

- If time allows, the teacher can lead a discussion on the importance of editing and human oversight in AI-generated content.

Homework Extension

- Students can individually modify their group final draft using the feedback provided by their peers. This will result in several different versions of the "final" product which can be compared in a future class, if desired.

Differentiation

Support for Struggling Students

- Provide additional scaffolding, such as guided prompts, a more detailed editing checklist, and more direct teacher support during brainstorming and editing.
- Pair students who grasp concepts quickly with those who might need more time, promoting peer learning.

Extensions for Advanced Students

- Challenge these students to incorporate additional elements into their projects, such as multimedia components.
- Ask students to compile all the information they entered into ChatGPT multiple prompts to develop one very specific prompt. Open a new session of ChatGPT and paste in the very specific prompt. Compare the output using the specific prompt with their initial output having a conversation with the chatbot.
- Ask students who finish early to consider the use of AI by authors who are writing a book. Invite them to discuss this within their group.

Assessment

Formative assessments:

- Demonstration and Practice: As students experiment with ChatGPT and create simple texts, the teacher can informally assess their understanding of how to interact with AI and craft effective prompts. This is formative as it occurs during the learning process and helps guide future instruction.
- Group Brainstorming and Editing: The brainstorming session and initial editing offer insights into students' ability to generate ideas, understand project requirements, and plan revisions. This is formative, providing immediate feedback that can influence the next steps in project development.
- Editing Workshop: The editing workshop allows for real-time observation of students' editing skills and their ability to apply feedback. This is a formative assessment, as it provides opportunities for immediate teacher intervention and guidance.
- Peer Feedback: Include peer feedback as part of the assessment, emphasizing constructive criticism and collaboration.

Summative assessments:

- Project Rubric: Assess the final products based on creativity, coherence, adherence to project guidelines, and the quality of editing.
- Reflection: Evaluate students' reflections for insight into their understanding of AI's role in content creation and the editing process.

Background Information

Prior to this lesson, students should have the following basic knowledge:

Students should be comfortable using computers or tablets, including basic navigation, typing, and using web browsers. This includes understanding how to safely and effectively search for information online, as these skills are essential for interacting with the ChatGPT platform and conducting any necessary research during the project.

A basic understanding of what AI is and some common applications in daily life (such as voice assistants, recommendation systems, etc.) will be beneficial. Students do not need in-depth technical knowledge but should grasp that AI involves machines or programs performing tasks that typically require human intelligence. AI includes a lot of different types of tasks from generating text to recognizing faces to driving cars.

An understanding of digital citizenship, including the ethical use of technology and internet safety, is crucial. Students should be aware of the importance of respecting copyright, privacy, and the responsible use of AI tools like ChatGPT.

ChatGPT is a powerful AI language model developed by OpenAI that can generate text based on prompts it receives. It can be used for various purposes, including creating stories, essays, poems, and more. Understanding how to effectively use and edit AI-generated content is a valuable skill in the digital age. Teachers and students will not need an account to be able to use ChatGPT, but having an account will allow them to save their past conversations. If ChatGPT is not accessible at your school, alternative AI language models such as MagicSchool AI, Gemini, CoPilot, or Azure can also be used.

Potential Writing Assignments

Creative Writing

- **Fantasy Adventure:** Write a story about a young wizard who discovers a secret map leading to a hidden city. What challenges are faced along the way, and what is found?
- **Science Fiction:** Imagine a future where humans live alongside intelligent robots. Write a day in the life of a teenager in this world.
- **Mystery:** A mysterious, ancient book is found in the school library. It's said to be cursed. Write a story about a group of friends who decide to uncover its secrets.

Persuasive Writing

- **Environmental Advocacy:** Write a persuasive essay on the importance of renewable energy sources over fossil fuels.
- **Education Reform:** Argue for or against the necessity of homework in schools. Use evidence and examples to support your position.
- **Animal Rights:** Persuade your audience that adopting pets from shelters is more ethical than buying from pet stores.
- **General:** Write a persuasive essay on a topic of your choice that is appropriate for school. Clearly support your position with evidence and logical reasoning.

Informational/Expository Writing

- **Nuclear Energy:** Explain how nuclear power plants generate electricity using nuclear fission. Include the benefits of nuclear energy as a low-carbon energy source, as well as the challenges related to safety and waste management.
- **Historical Figure Profile:** Choose a lesser-known historical figure and write an informational piece about their contributions to their field or society.
- **Technology Exploration:** Explain how smartphones have changed the way people communicate. Include both positive and negative impacts.
- **Space Exploration:** Describe the role of the International Space Station (ISS) in advancing scientific research. What types of experiments are conducted there, and how do they benefit humanity?
- **Human Body Systems:** Choose one system in the human body (e.g., circulatory, respiratory, or digestive) and explain how it works. Include examples of how it interacts with other systems to keep the body functioning.
- **Robotics:** Describe how robots are used in manufacturing industries. Highlight the advantages of using robots for tasks like assembly and quality control and discuss any limitations or challenges.
- **Renewable Energy:** Explain how solar panels generate electricity and why they are considered an environmentally friendly energy source. Include the benefits and challenges of using solar energy.

Reflective Writing

- **Personal Growth:** Reflect on a challenge you've faced in the past year. How did you overcome it, and what did you learn?
- **Cultural Identity:** Write about a tradition or part of your culture that is important to you. How does it shape your identity?
- **Future Aspirations:** Where do you see yourself in ten years? Describe your life. What steps do you think you'll need to take to get there?

Editing AI Practice Essay

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- Structure: Is the organization appropriate?
- Human Touch: Does it sound like you wrote it?

The Discovery of DNA

James Watson and Francis Crick are scientists best known for discovering the structure of DNA, the molecule that carries genetic information. DNA acts like a set of instructions that determines how living organisms grow, function, and pass traits to their offspring. Before their discovery, scientists knew DNA was essential but didn't understand its shape. In the 1950s, Watson and Crick determined that DNA is a double helix, resembling a twisted ladder. This groundbreaking discovery helped explain how traits are inherited and marked a turning point in the study of biology.

Watson and Crick did not work in isolation—they relied on the contributions of other scientists, including Rosalind Franklin. Franklin used X-ray crystallography to capture detailed images of DNA, which revealed its spiral structure. However, her work was not properly credited at the time. Maurice Wilkins, Franklin's colleague, shared her images with Watson and Crick without her permission, helping them build their famous model. In 1953, Watson and Crick published their findings, describing DNA as a double helix with sugar and phosphate molecules forming the sides and paired nitrogen bases—adenine with thymine, cytosine with guanine—forming the rungs. This pairing mechanism explained how DNA replicates itself during cell division.

The discovery of DNA's structure revolutionized science and medicine. It allowed scientists to understand how genes function and how mutations can lead to diseases. This knowledge paved the way for advancements such as genetic testing, DNA fingerprinting, and treatments for genetic disorders. It also led to the development of genetic engineering, enabling scientists to modify DNA for medical purposes or to improve crops. While Watson and Crick's discovery is considered one of the greatest achievements in science, many believe Rosalind Franklin deserves more recognition for her critical contributions.

Example student edit suggestions:

1. Improve Clarity and Coherence

- Rephrase sentences to make them simpler and easier to follow:
    - Original: “DNA acts like a set of instructions that determines how living organisms grow, function, and pass traits to their offspring.”
    - Edited: “DNA is like a recipe that tells living things how to grow, work, and pass traits from parents to children.”

2. Improve Accuracy

- Even when facts are correct, add more specificity.
    - Original: “In the 1950s, Watson and Crick determined that DNA is a double helix, resembling a twisted ladder.”
    - Edited: “Watson and Crick determined that DNA is a double helix, resembling a twisted ladder and published a paper in the journal Nature in 1953.”

3. Add Creativity

- Include analogies or imagery to make the essay more engaging:
    - “The double helix looks like a spiral staircase, twisting elegantly upward. It’s amazing to think that something so small holds the key to life.”
    - “DNA is like a secret code hidden inside every cell, carrying messages that make you who you are.”

4. Enhance Structure

- Refine phrasing:
    - Original: “Maurice Wilkins, Franklin’s colleague, shared her images with Watson and Crick without her permission, helping them build their famous model.”
    - Edited: “Maurice Wilkins, Franklin’s colleague, showed her X-ray images to Watson and Crick without asking her first. These images helped them figure out the structure of DNA.”
- Break up longer sentences or paragraphs for better readability. Avoid using a dash in a sentence, which is unusual for students.

    - Original: “In 1953, Watson and Crick published their findings, describing DNA as a double helix with sugar and phosphate molecules forming the sides and paired nitrogen bases—adenine with thymine, cytosine with guanine—forming the rungs.”
    - Edited: “In 1953, Watson and Crick published their findings. They described DNA as a double helix, with sugar and phosphate molecules making up the sides. The rungs of the ladder are made of paired nitrogen bases: adenine pairs with thymine, and cytosine pairs with guanine.”

5. Provide a Human Touch

- Add emotional or human elements to the story:
    - “Rosalind Franklin’s story is inspiring but also sad because she didn’t get the credit she deserved during her lifetime. It makes me wonder how many other scientists have been overlooked.”
    - “When I learned about DNA, I felt amazed that something so tiny can hold all the information about me, like my eye color or even my personality.”
- Add reflections or connections to their own experiences:
    - “Learning about Watson and Crick’s discovery makes me think about how many mysteries of science are still waiting to be solved. Maybe one day, I’ll be part of a team that makes an important discovery like this!”
    - “It’s fascinating to think that their work has led to things like genetic testing, which can help people understand their health better. Science really has the power to change lives.”

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The Periodic Table of Elements

The periodic table of elements is one of the most important tools in chemistry. It organizes all known elements, which are the building blocks of matter, into a structured chart based on their properties. Dmitri Mendeleev, a Russian scientist, created the first version of the periodic table in 1869. He arranged the elements by their atomic weights and noticed patterns in their chemical behavior. Today's periodic table is organized by atomic number, which represents the number of protons in an atom. This modern arrangement helps scientists predict how elements will react with each other and understand their similarities and differences.

The periodic table is divided into rows, called periods, and columns, called groups. Each group contains elements with similar chemical properties. For example, the elements in Group 1, called alkali metals, are highly reactive and often combine with other elements to form compounds. On the other hand, elements in Group 18, known as noble gases, are very stable and rarely react with anything. The table also includes metals, nonmetals, and metalloids, which are categorized based on their physical and chemical characteristics. The periodic table is like a map for chemists, guiding them in their experiments and discoveries.

The periodic table has changed over time as scientists discovered new elements. For example, synthetic elements like Californium and Einsteinium were created in laboratories and added to the table. These discoveries show how chemistry is always evolving and expanding our understanding of the universe. The periodic table isn't just a chart—it's a symbol of human curiosity and the desire to uncover the secrets of nature. It reminds us that science is a journey, and there's always more to learn.

Example student edit suggestions:

1. Improve Clarity and Coherence

- Rephrase sentences to make them simpler and easier to understand:
    - Original: “The periodic table is divided into rows, called periods, and columns, called groups.”
    - Edited: “The periodic table is organized into rows, which are called periods, and columns, which are called groups.”

2. Improve Accuracy

- Even when facts are correct, add more specificity.
    - Original: “Today’s periodic table is organized by atomic number, which represents the number of protons in an atom.”
    - Edited: “The modern periodic table is organized by atomic number, which is the number of protons in the nucleus of an atom.”

3. Add Creativity

- Include analogies or imagery to make the essay more engaging:
    - “The periodic table is like a puzzle where each element fits perfectly into its spot, showing how nature is beautifully organized.”
    - “Imagine the periodic table as a giant library of elements, each with its own unique story and personality.”

4. Enhance Structure

- Refine phrasing:
    - Original: “Each group contains elements with similar chemical properties.”
    - Edited: “Elements in the same group share similar chemical behaviors and characteristics.”
- Break up longer sentences or paragraphs for better readability:
    - Original: “The periodic table has changed over time as scientists discovered new elements. For example, synthetic elements like Californium and Einsteinium were created in laboratories and added to the table.”

    - Edited: “The periodic table has changed a lot over time. Scientists have discovered new elements, including synthetic ones like Californium and Einsteinium, which were created in laboratories and later added to the table.”

- Avoid using a dash in a sentence, which is unusual for students:
    - Original: “The periodic table isn’t just a chart—it’s a symbol of human curiosity and the desire to uncover the secrets of nature.”
    - Edited: “The periodic table is more than just a chart! It represents humanity's curiosity and desire to uncover the secrets of nature.”

5. Provide a Human Touch

- Add emotional or human elements to the essay:
    - “Dmitri Mendeleev’s discovery was groundbreaking, but it’s inspiring to think he created the first periodic table without all the tools we have today. It shows how determination can lead to incredible achievements.”
    - “The periodic table makes me appreciate how much effort scientists have put into understanding our world.”
- Add reflections or connections to their own experiences:
    - “When I first saw the periodic table in class, I thought it was just a bunch of boxes. But now I realize how much information it holds about the world around us.”
    - “The periodic table inspires me to learn more about chemistry and maybe even work in a lab one day!”

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The Invention of the First Computer

The invention of the first computer was a groundbreaking moment in history that changed the way humans solve problems. In the 1940s, a team of engineers led by John Presper Eckert and John Mauchly created the ENIAC (Electronic Numerical Integrator and Computer), widely considered the first general-purpose electronic computer. ENIAC was massive—it weighed over 27 tons and took up an entire room. It was originally designed to calculate artillery trajectories during World War II, but its creators realized it could solve a wide range of mathematical problems. The ENIAC was faster than any machine before it, completing calculations in seconds that would have taken humans hours or even days.

The ENIAC laid the foundation for modern computers, but it wasn't perfect. Programming the ENIAC was a tedious process that involved manually connecting cables and switches to perform different tasks. Despite this, it was revolutionary because it demonstrated that machines could process information and automate complex calculations. The invention of the ENIAC inspired further innovations in computer science, including the development of programming languages and smaller, more efficient computers. Without the ENIAC, we might not have the smartphones, laptops, or supercomputers we rely on today.

The invention of the ENIAC also highlights the contributions of women in computer science. A group of six women, including Kay McNulty and Jean Jennings, were the first programmers of the ENIAC. They worked tirelessly to figure out how to program the machine, even though their contributions were largely overlooked at the time. Today, their work is recognized as a critical part of computer science history. The story of the ENIAC reminds us how innovation often comes from teamwork and creativity. It's amazing to think that such a large, clunky machine was the first step toward the sleek, powerful computers we use every day.

Example student edit suggestions:

1. Improve Clarity and Coherence

- Rephrase sentences to make them simpler and more accessible:
    - Original: “The ENIAC was faster than any machine before it, completing calculations in seconds that would have taken humans hours or even days.”
    - Edited: “The ENIAC was the fastest machine of its time. It could solve problems in seconds that would take people hours or days to figure out.”

2. Improve Accuracy

- Even when facts are correct, add more specificity.
    - “The ENIAC was completed in 1945 and officially unveiled to the public on February 15, 1946, at the University of Pennsylvania. During its first demonstration, it successfully calculated a trajectory for a cannon shell in just 20 seconds.”

3. Add Creativity

- Include analogies or imagery to make the essay more engaging:
    - “The ENIAC was like a giant brain made of wires and switches, solving problems faster than anyone could imagine.”
    - “Imagine a machine so big it looked like a maze of cables and circuits. That’s what the ENIAC was like.”

4. Enhance Structure

- Refine phrasing:
    - Original: “Despite this, it was revolutionary because it demonstrated that machines could process information and automate complex calculations.”
    - Edited: “Even though programming the ENIAC was difficult, it was revolutionary because it showed that machines could process information and handle complex calculations automatically.”
- Break up longer sentences or paragraphs for better readability:
    - Original: “The invention of the ENIAC inspired further innovations in computer science, including the development of programming languages and smaller, more efficient computers.”

    - Edited: “The ENIAC’s invention inspired many other innovations in computer science. It led to the creation of programming languages and smaller, more efficient computers.”

- Avoid using a dash in a sentence, which is unusual for students:
    - Original: “ENIAC was massive—it weighed over 27 tons and took up an entire room.”
    - Edited: “ENIAC weighed over 27 tons and took up an entire room.”

5. Provide a Human Touch

- Add emotional or human elements to the story:
    - “It’s inspiring to think about the women who programmed the ENIAC. They didn’t have programming languages or modern tools. They just had to figure everything out from scratch.”
    - “The story of the ENIAC shows how teamwork and creativity can lead to amazing breakthroughs.”
- Add reflections or connections to their own experiences:
    - “It’s hard to imagine living in a time when computers were so big they filled an entire room. Now, I can carry my computer in my pocket!”
    - “Learning about the ENIAC makes me appreciate how far technology has come. It’s exciting to think about what computers will be able to do in the future.”

Name:_____ Date:_____

Evaluating AI Output Rubric

	1	2	3	4
Prompt Development	Prompt is unclear, overly simple, or does not align with the project goal.	Prompt is vague or generic, resulting in limited AI-generated content.	Prompt is clear and relevant but could benefit from additional detail or refinement.	Prompt is highly specific, detailed, creative, and clearly aligns with the project goal.
Use of AI to Refine Output	Did not refine the AI's output or made no meaningful changes.	Minimally refined the AI's output, with only minor changes or improvements.	Refined the AI's output at least once, with noticeable improvements in clarity, detail, or focus.	Actively refined the AI's output through multiple interactions and adjustments to the prompt, resulting in a significant improvement in quality.
Human Edits	Final product is largely unchanged from the original AI output, with little to no editing effort.	Final product shows minimal improvement, with only surface-level edits or corrections.	Final product shows noticeable improvements, but some areas could still be refined.	Final product is significantly improved through thoughtful edits, including enhanced clarity, creativity, and attention to detail.
Collaboration and Participation	Did not participate meaningfully in group activities or feedback.	Contributed minimally to group activities and feedback, with limited engagement.	Participated consistently and contributed useful ideas, but involvement could have been more active or consistent.	Actively contributed to the group, demonstrated leadership or teamwork, and engaged fully in peer feedback activities.
Reflection and Learning	Reflection is incomplete or does not provide meaningful insights about the project.	Reflection is brief and lacks depth, with limited insights about the learning process.	Reflection provides meaningful insights but could be more detailed or reflective.	Reflection is thoughtful and detailed, demonstrating clear insights about the learning process and the strengths/limitations of AI.