

Illustrating Step-by-Step Processes using AI Image Generators

Why?	
This lesson introduces students to the practical applications of AI technology, building their AI literacy and understanding. This exposure to AI tools and their creative potential prepares students for the increasingly AI-driven world, where understanding and working with AI is a valuable skill. Furthermore, this lesson fosters critical thinking, creativity, and problem-solving abilities, as students select and evaluate AI-generated images to effectively communicate step-by-step processes. This will equip students with essential skills that extend beyond the specific use case, preparing them for the challenges and opportunities of the digital age.	
Materials Needed	Time needed
• Computers or tablets with internet access • Access to an AI image generation tool (listed at the end of this lesson) • Access to an AI text generation tool (e.g., ChatGPT, Bing, Google Bard) • A sample recipe with steps for the initial activity • Projector for demonstrations • Markers and whiteboard for brainstorming	Approximately 60 - 75 minutes (could be split over multiple class periods)
Objectives	
• Students will be able to effectively communicate the steps of a process using visuals. • Students will be able to use an AI image generator to produce images based on their prompts. • Students will be able to apply critical thinking and creativity skills in selecting appropriate images for each step.	
Key Concepts & Vocabulary	
• AI (Artificial Intelligence): Computer systems that can perform tasks that typically require human intelligence, such as understanding natural language, learning from data, and making decisions • Image Generation: Creating visual content, such as pictures or graphics, using computer algorithms or models based on text descriptions.	

- **Visual Communication:** Conveying information, ideas, or messages through visual elements, including images, diagrams, charts, and graphics, to facilitate understanding.

Lesson

- **Introduction:** Begin by discussing the importance of visual aids in conveying information effectively
 - a. Introduce the concept of AI and its applications, including image generation
 - b. Explain the main goal of the lesson: To use AI-generated images to illustrate a step-by-step process
- **Demonstration:** Show students an example of generating a step-by-step process using the example of an online recipe.
 - a. On the classroom projector, go to a recipe site, such as allrecipes.com
 - b. Find a recipe that doesn't already have step-by-step images.
 - c. Copy the first recipe step and paste the text into an image generator (see links at the end of the document)
 - d. Copy and paste the recipe step and the image into a Google or Word doc. (See example on the last page)
 - e. Continue with the remaining steps of the recipe (or at least a few more)
- **Check-in:** How effective was the AI at generating images that reflected the step in the process? Did I need to provide text in addition to the step itself in order to get images that continued the process? (At times, you may need to add in details. Pasting one step at a time will sometimes overlook details that came from previous steps.)
- **Guided Practice:** Instruct students (individually or in pairs) to come up with ideas for other how-to or step-by-step processes that could benefit from the visual communication of steps in the process.
 - a. Suggestions: Science experiment, DIY craft, gardening care, fitness routines, home or car maintenance, technology setup, historical timeline, first aid procedures, job search, hobby and leisure activities, construction projects
 - b. Write ideas on the board as students suggest them
 - c. Have students select the idea they would like to use
 - d. Instruct students to write down the process in approximately five steps.
 - i. Students could use a text generator to help them narrow the process into five steps.
 - ii. For example, have students access ChatGPT and prompt it with something like "Give me the process of changing a car's oil, broken down into five steps in order."
 - e. On their computers, students follow the same process the teacher illustrated earlier in class - pasting the text of each step into an image generator, then putting the text and images into a word processing document. (See example at the end of this plan)
 - f. When complete, students share their completed documents with teacher to show the class

- g. Present the student documents to the class. For each document, the students who created it can discuss their process in determining the steps and why they chose images they did.

Discussion Questions

- What are some advantages of using AI-generated images to illustrate steps in a process, compared to using traditional illustrations or photographs?
- How can the choice of keywords or text descriptions impact the quality and relevance of the AI-generated images? Can you provide an example?
- Do you think AI-generated images can accurately capture the nuances or details of every step in a process, or are there limitations to their effectiveness? What are some downsides of trying to learn a new process with these images to help you?
- How can the use of AI-generated images enhance the accessibility of instructional materials for individuals with different learning styles or needs?
- What criteria did you use to select images for your assigned steps, and how did you ensure they conveyed the intended message clearly?
- What could be a potential future application for AI image generation in learning something new, beyond illustrating steps in processes?

Supplemental Activity Ideas

- **AI vs Human:** Have students compare AI-generated images with existing illustrations they find online for portions of the same process steps to explore the advantages and disadvantages of each approach.
- **AI Art Showcase:** Challenge students to create AI-generated images that are more effective at getting information across. Encourage them to modify their prompts to get the most possible information across.

Sources to Learn More

Simple free AI image generators

- Bing Image Creator - www.bing.com/images/create
- Ideogram - www.ideogram.ai
- Craiyon - www.craiyon.com
- Wombo Dream - www.dream.ai

Sample AI Image Generation of Recipe

This recipe is for Copycat Panera Broccoli Cheese Soup, on allrecipes.com. This uses several different image generators. Each image was scaled down to 2 inches in width.

1. Cook the onion and set aside.



(image by Bing Image Creator)

2. Make the roux, and then whisk in the milk.



(Image by Ideogram)

3. Add chicken stock and bring to a simmer and cook until thick.



(Image by Craiyon)

4. Stir in the broccoli, carrots, celery, and sautéed onion (added “to the soup” at the end of the prompt so it would still look like a soup)



(image by Wombo Dream)

5. Add the cheese (to the soup) and stir until melted, then season before serving.



(image by Bing Image Creator)

Final Product: Copycat Panera Broccoli Cheese Soup



(image by Ideogram)

Sample AI Image Generation of Process

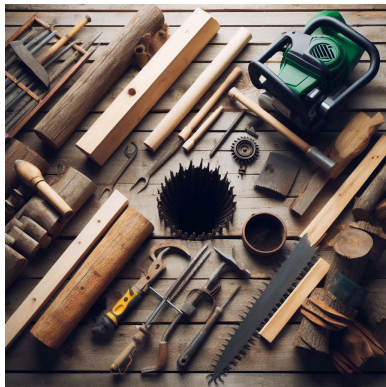
ChatGPT's plan for building a fence, reduced to five steps. Prompts needed to be modified in order to get five steps that had specific instructions that could be shown visually. (All images in this process are from Bing Image Creator.)

Building a Fence

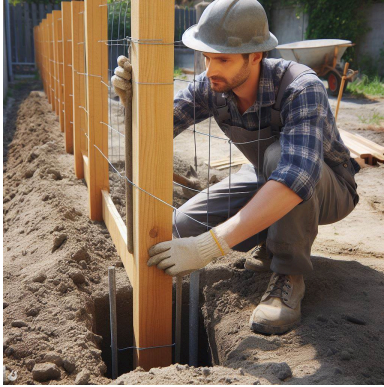
1. Plan and prepare the fence project, considering its purpose, regulations, materials, and measurements.



2. Gather fence posts, rails, a post hole digger, and a circular saw for building the fence.



3. Set the fence posts securely in cement in the ground.



4. Install the fence structure, including rails and panels or pickets.



5. Apply finish to the completed fence.

