

Adobe Photoshop

2025 Release



Classroom in a Book®

The official training workbook from Adobe

Conrad Chavez

FREE SAMPLE CHAPTER |



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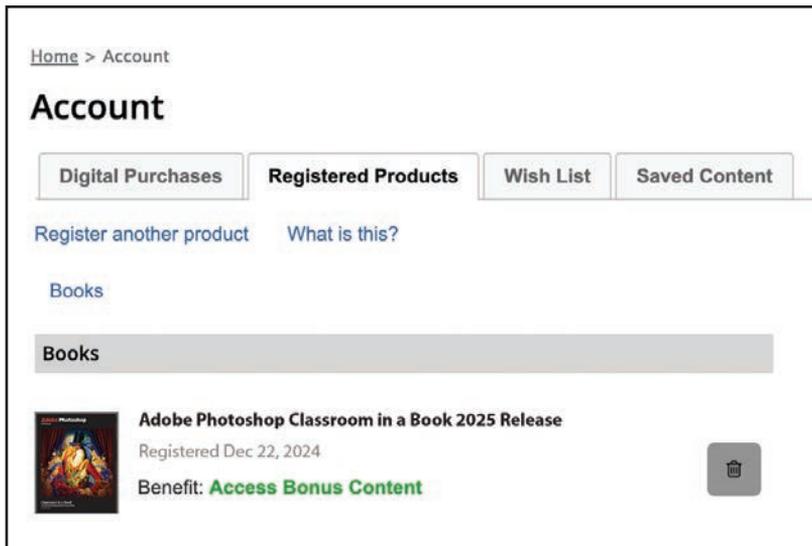
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WHERE ARE THE LESSON FILES?

Purchase of this Classroom in a Book in any format gives you access to the lesson files you'll need to complete the exercises in the book.

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 - 3 Click Submit.
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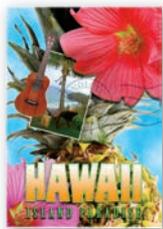
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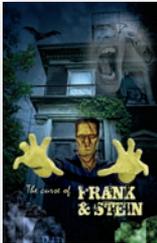
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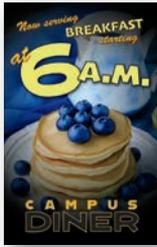
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EXPLORING GENERATIVE AI

Lesson overview

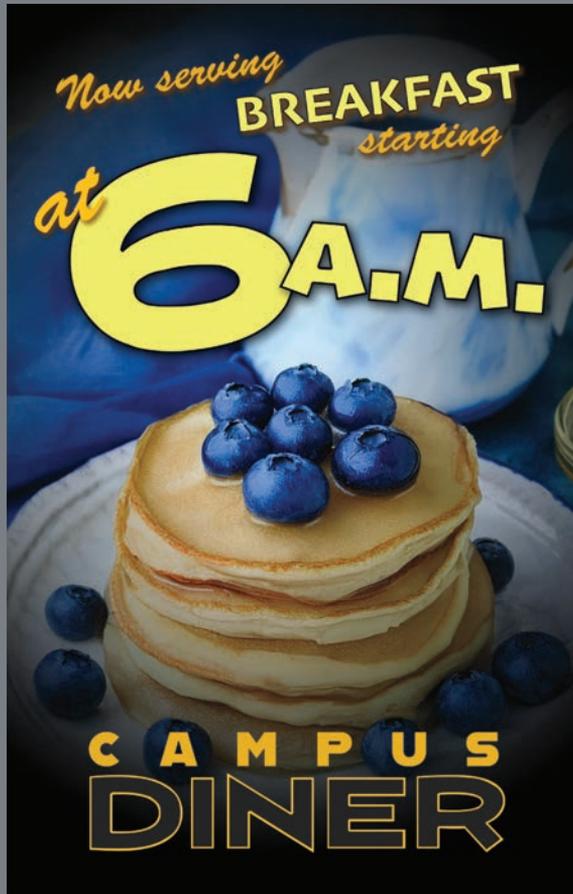
In this lesson, you'll learn how to do the following:

- Create and enhance images using generative AI features.
- Refine the results of generative AI to get the image you want.
- Use different types of generative AI features in Photoshop.
- Understand how Adobe Firefly generative AI handles issues related to generative AI, such as rights and credits.



This lesson will take about 30 minutes to complete. To get the lesson files used in this chapter, download them from the web page for this book at peachpit.com/PhotoshopCIB2025. For more information, see “Accessing the lesson files and Web Edition” in the Getting Started section at the beginning of this book.

As you work on this lesson, you'll preserve the start files. If you need to restore the start files, download them from your Account page.



PROJECT: BREAKFAST PROMOTION

Adobe Firefly generative AI is built into Photoshop so that you can quickly explore visual ideas and create photorealistic or illustrative images simply by describing what you want.

About Adobe Firefly generative AI

The term *artificial intelligence*, or *AI*, isn't new; you've probably been hearing it for years, and it's been around for decades. For most of that time, AI has been about calculating results or analyses that seem unusually advanced. More recently, AI has been extended to include visual recognition such as being able to identify faces and read text in images.

Generative AI is much newer, and it's called "generative" because it isn't just about calculating or recognizing — it can create entirely new content. You saw this in Lesson 1 when you used Generative Fill to extend a photo into an empty area, convincingly, in seconds. Traditionally, you'd do this kind of image extension by hand using a cloning tool to copy image content to the empty area, but there was always the risk of areas being obvious repetitions of something else in the image, and it took a significant amount of time.

The ability of generative AI to seemingly invent completely new photorealistic images or write new text or music seems miraculous or magical, but in reality, generative AI only knows what to create based on its model of the problem and how well that model has been trained. Generative AI models are trained using very large sets of examples. Generative AI in Photoshop is trained on hundreds of millions of images. Because the quality of generative AI depends on its training, generative AI is constantly improving as the models are trained on more examples.

Generative AI is used not only in Photoshop but throughout many Adobe applications and services. For example, anyone can try generative AI in Adobe Express, a set of easy-to-use creative tools that work in a mobile app or web browser. Adobe gave their overall generative AI technology its own name, Adobe Firefly, and added Firefly capabilities into many of their applications including Photoshop.

There are some guidelines and restrictions for using Firefly generative AI; see www.adobe.com/legal/licenses-terms/adobe-gen-ai-user-guidelines.html.

How does Photoshop use generative AI?

Adobe Firefly generative AI is so useful that it appears in different forms throughout Photoshop so that it can help solve a range of challenges. You'll find generative AI in places including:

Contextual Task Bar. After you create a selection marquee using any tool or method, the Contextual Task Bar offers a button such as Generative Fill or Generate Image; you learned this in Lesson 2. When the Contextual Task Bar is hidden or when the document context (such as the layer type selected in the Layers panel)

doesn't display generative AI options, generative AI features are still available in other ways.

Edit menu. On the Edit menu, you'll find the Generative Fill, Generate Image, and (in some versions) Generative Workspace commands. You'll learn about all three of those later in this lesson.

Options bar. Some tools contain generative AI options. The Remove tool you tried in Lesson 2 has a Mode menu that includes generative AI options that can improve the results. In Lesson 5, you learned that the Crop tool has a Generative Expand option for filling empty areas created by cropping and straightening.

Many of these features didn't exist a few years ago, and people are finding new uses for generative AI all the time. Don't be surprised if there are even more generative AI features in Photoshop by the time you read this.

In earlier lessons, you used generative AI to repair or extend images. That use of generative AI is as a production tool to improve images you created or already have. Now it's time to try using generative AI the other way: to create whole new images!

Getting started

You'll use generative AI to complete a document that helps promote an earlier start time for breakfast service at a restaurant. The document needs to be easy to adapt for the different ways the restaurant wants to promote the service, so it's been designed as a tall, narrow document so that it can easily be exported for posting on vertical format social media feeds, and it also matches a common size for an ad in a print publication.

- 1 Start Photoshop, and then simultaneously hold down Ctrl+Alt+Shift (Windows) or Command+Option+Shift (macOS) to restore the default preferences. (See "Restoring default preferences" on page 5.)
- 2 When prompted, click Yes to delete the Adobe Photoshop Settings file.
- 3 Choose File > Browse In Bridge to open Adobe Bridge.
- 4 In Bridge, click Lessons in the Favorites panel. Double-click the Lesson15 folder in the Content panel.
- 5 Compare the files 15_Start.psd and 15_End.psd.
- 6 In Bridge, double-click the 15_Start.psd file to open it in Photoshop. If the Embedded Profile Mismatch dialog box appears, click OK.
- 7 Save the document as **15_Working.psd** in the Lesson15 folder. If the Photoshop Format Options dialog box appears, click OK.

● **Note:** If Bridge isn't installed, the File > Browse In Bridge command in Photoshop will start the Creative Cloud desktop app, which will download and install Bridge. After installation completes, you can start Bridge. For more information, see page 3.

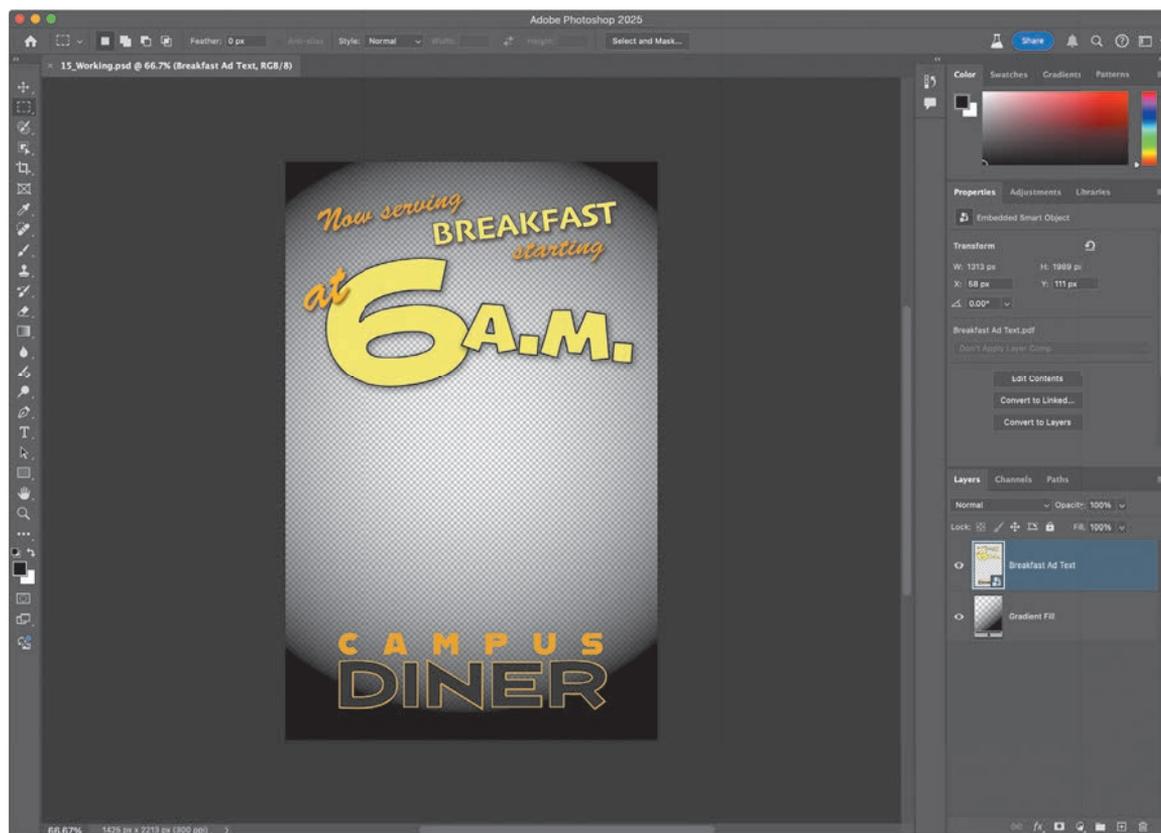
● **Note:** If Photoshop displays a dialog box telling you about the difference between saving to Cloud Documents and On Your Computer, click Save On Your Computer. You can also select Don't Show Again, but that setting will deselect after you reset Photoshop preferences.

Generating a complete image

● **Note:** The examples of generative AI images in this lesson may differ from the results you get, in part because, over time, Adobe Firefly generative AI is likely to be updated and trained with more images to improve the results.

In earlier lessons, you used generative AI to enhance existing images. Another popular use of generative AI is to create entirely new images. The `15_Start.psd` document needs an appealing image of a breakfast.

You do have to think about how appropriate generative AI is for the project you're working on. This project promotes a general breakfast service and not a specific named dish, so a generative AI image may be acceptable; but always check with the client. If the promotion was about a specific item on the menu, it would be much better to commission a photograph of what that menu item actually looks like.



The lesson file has two layers. The bottom layer, Gradient Fill, is a radial gradient that goes from transparent in the center to black at the edge. If you want to inspect how it's set up, in the Layers panel select the Gradient Fill layer, and then

in the Tools panel select the Gradient tool so that the Properties panel displays Gradient Adjustment options. The gradient is transparent in the center so that after you generate an image and move it to the bottom of the layer stack, you'll be able to see the image through the gradient.

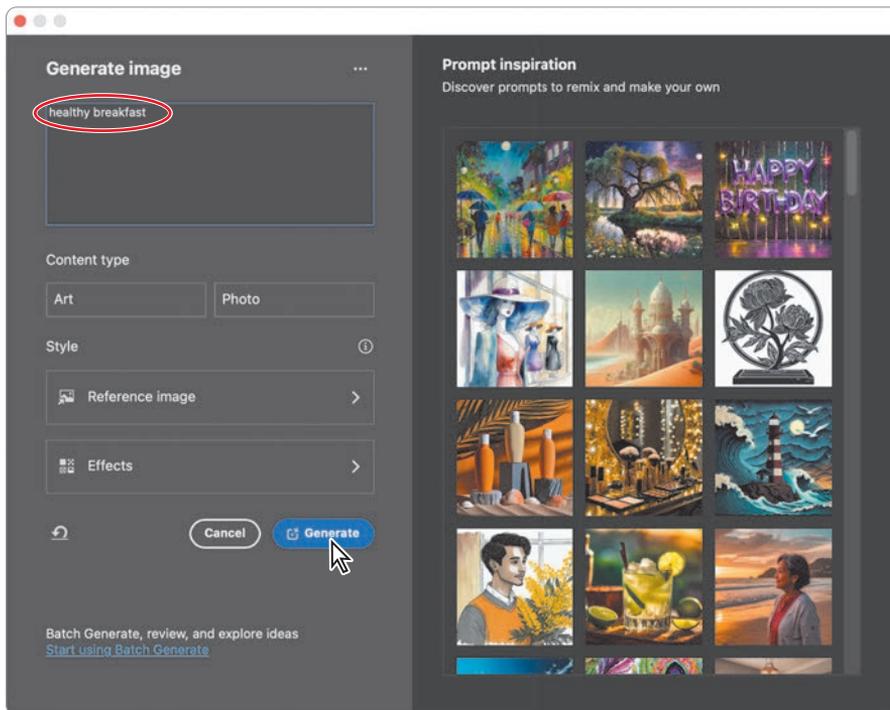
The top layer, Breakfast Ad Text, was created in Photoshop as a separate document and saved as a Photoshop PDF to maintain its vector outlines. It was then brought into this lesson file using the File > Place Embedded command, which adds it to the Layers panel as an embedded Smart Object.

If the document contained a pixel layer and it was selected, the Contextual Task Bar might offer a Generate Image button. Neither of the existing layers is a pixel layer (one is an embedded Smart Object layer and the other is a gradient fill layer), but that's not a problem; you can still use generative AI from the Edit menu.

- 1 Choose Edit > Generate Image.
- 2 In the Generate Image dialog box, click in the "Describe..." prompt box, type **healthy breakfast** to describe the image for it to generate, and then click Generate. If a message appears asking you to read and agree to the Generative AI User Guidelines, click Agree when you're ready.

► **Tip:** Because the vector text outlines in the Breakfast Ad Text layer are preserved in Photoshop PDF format, the text edges remain smooth if you scale up that Smart Object layer.

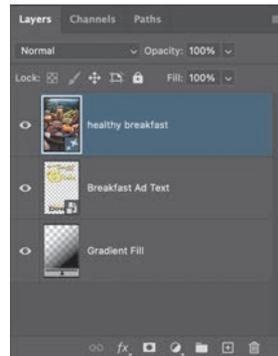
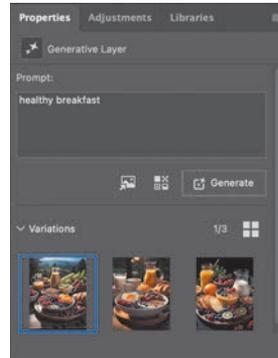
► **Tip:** The prompt in step 2 uses just two words, but it's common for a prompt to use more words to get the image you want.



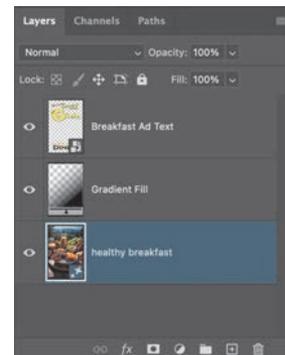
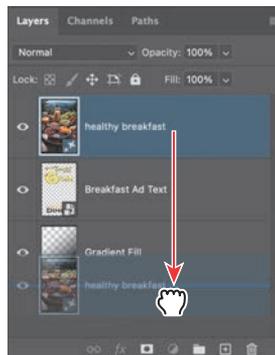
Generating images may take some time. When it finishes, you'll see that:

- On the canvas, the empty selection is replaced with new content.
- In the Layers panel, a new Generative Layer was created, and the name of the layer is the prompt you entered.
- In the Properties panel, as long as a generative layer is selected, a Variations section offers alternatives you can click to try. The selected variation is the one you see on the canvas.

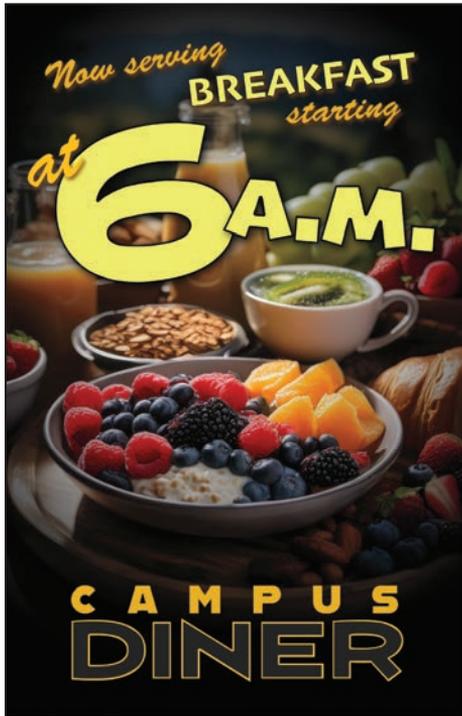
● **Note:** If you don't see the Variations section, it may be out of view, especially on a smaller display. Try scrolling the Properties panel to bring the Variations panel up and into view.



- 3 In the Layers panel, drag the Healthy Breakfast layer to the bottom of the layer stack so that you can see the design working as intended, showing the text and radial gradient in front of the image.



- 4 In the Variations section of the Properties panel, click the other variations in turn, and leave selected the variation you think is the best.



► **Tip:** Variations are saved with the document, so if you think the document file size is too large, delete any variations you are sure you don't want to keep.

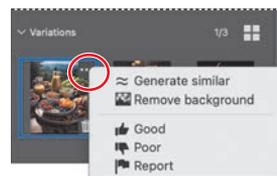
- 5 Save the document.

Refining a generative layer

It's common for the first results of a prompt to be too far from the image you actually want. Photoshop offers ways to make the results closer to what you want.

- 1 In the Variations section of the Properties panel, hover over the first variation and click the ellipsis (...) menu. You don't have to click any of the options, but note what they are:

- Generate Similar creates another set of variations for the same prompt.
- Remove Background attempts to isolate the subject and erase the background. However, manually selecting and removing the background might work better.
- Good, Poor, and Report don't change the current variation but are a way of providing feedback to Adobe about the quality of the results of generative AI.



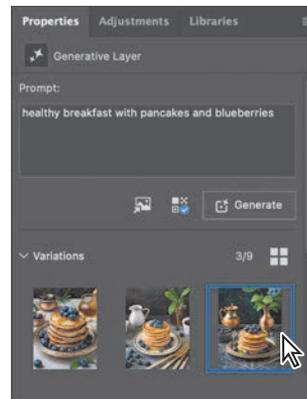
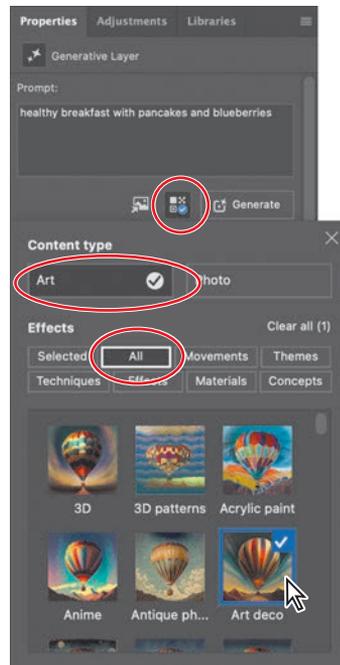
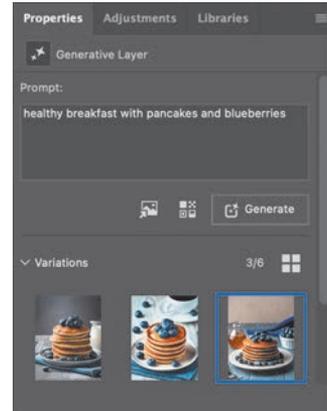
Another way to change the results is to change the prompt.

► **Tip:** The Enter or Return key is a shortcut for clicking the Generate button.

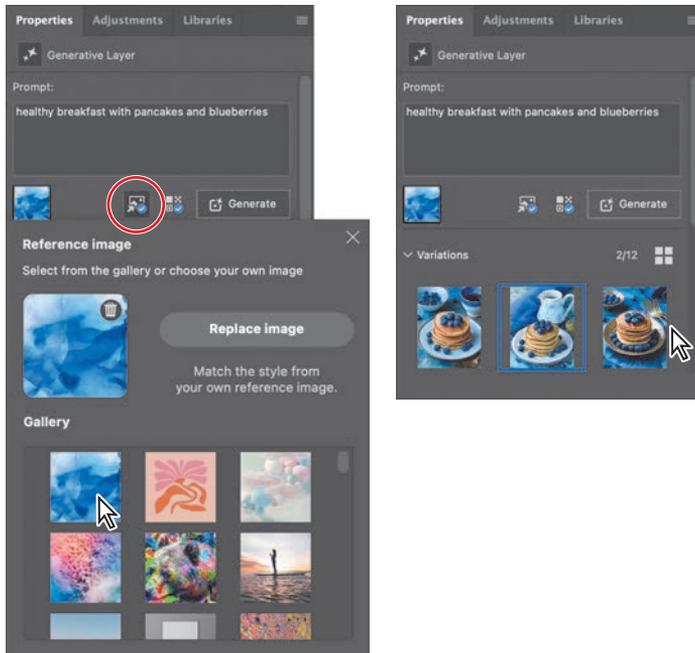
- 2 In the Properties panel, click in the Prompt box, enter a variation on “healthy breakfast” by adding descriptive words, click Generate, and select the variation you like the most. We entered **healthy breakfast with pancakes and blueberries** and **blueberries**.

So far the variations are photorealistic. Next you’ll choose a more illustrative style that you can customize.

- 3 Click the second icon below the Prompt box to open style options, select Art, and select a specific look from the Effects category. We clicked All, and then selected Art Deco.
- 4 Click Generate and select the variation that works best with the design.



- 5 Click the first icon below the Prompt box to open Reference Image options. Select one of the images (we selected the first one), click Generate, and select the variation you like the most. These results were influenced by the style of the reference image you selected.



How is Reference Image different than the Effects? Selecting a reference image is a way for you to influence variations using any image. The images in the Gallery are simply examples, but a great use of Reference Image is for generating art based on your personal style. To do this, open Reference Image options, click the Replace Image button, and select an image that represents your style. Of course, you can also use Reference Image to generate art based on a style you want to emulate, such as a client's style.

Take a look at the icons for Reference Image and Style Effects and remember them, because they appear in other places in Photoshop where you can use generative AI. For example, those options are also available on the Contextual Task Bar for generative fill and in the Generative Workspace dialog box (see the sidebar "Save time with Generative Workspace" on page 399).

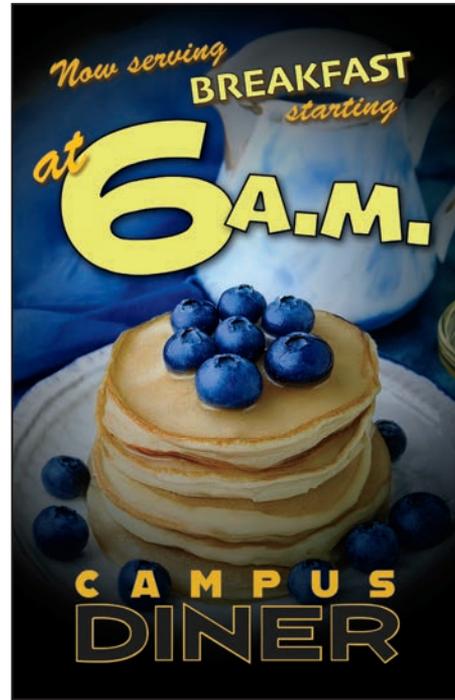
- 6 Feel free to continue to explore Firefly generative AI.

For 15_End.psd, we went with one of the photographic variations. Don't expect to match our results exactly because the Firefly model and training may change over time. Just create and select a variation that you think works the best for the promotional image.

- 7 When you're done, save and close the document.

The document is now ready to save or export copies for various media using workflows you've learned in earlier lessons, such as exporting for the web, printing on your own printer, or exporting for a print service provider.

● **Note:** At the time this lesson is being written, the maximum pixel dimensions of a generative AI image in Photoshop is 2000 × 2000 pixels. If you use generative AI on larger areas, the 2000 × 2000 pixel result will be scaled up.



About generative credits

Generative AI requires significant computing power. Sometimes it can all be done on your computer. Other times, the fastest way to generate the results is for Photoshop to send the prompt and image to Adobe Firefly on a Creative Cloud server where the results are generated using a much more powerful computer, and then on your computer, Photoshop receives the results and integrates them with your Photoshop document.

It takes a lot of cloud computing power to run generative AI, so Adobe came up with a system to manage server usage called Generative Credits. Creative Cloud members receive a certain number of Generative Credits every month. The number of credits you get depends on the Creative Cloud plan used by you or your school or organization. If you run out of Generative Credits before the end of a month, you can continue to use Generative Fill, but it may run more slowly because your jobs will have a lower priority. If you need to restore performance priority, it's possible to purchase more credits. For more information, including how to see the number of generative credits you have in the current month, see helpx.adobe.com/firefly/using/generative-credits-faq.html.

Adobe continues to work out how to best provide generative AI services, so Generative Credits policies may change or improve over time.

Save time with Generative Workspace

Choose Edit > Generative Workspace to open a dialog box that offers a more efficient, streamlined way to create the images you want.

Check your work.

Generative Workspace remembers your prompts and results on a timeline, so if you want to better understand how you created a certain set of images, you can roll back the timeline to take a closer look at what you entered and how you refined it.

Generate in parallel.

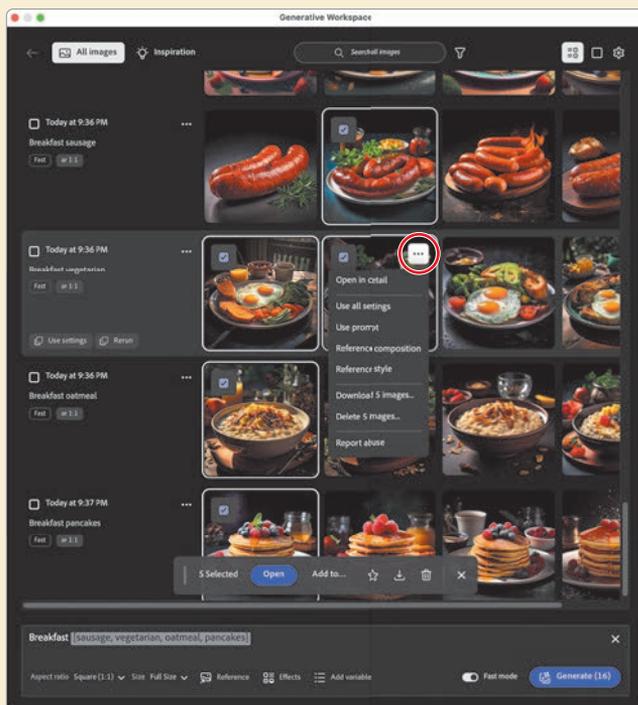
You can quickly generate different sets of variations in parallel. Instead of waiting for the results of a prompt before trying another prompt, you can apply multiple prompts, and each set of variations appears in the timeline when they're ready.

Generate specific variations in a single prompt.

If you want to see slight variations on a prompt, you can type variables within brackets, separated by commas. For example, you could enter “breakfast [sausage, vegetarian, oatmeal, pancakes]” and Firefly will generate four breakfasts modified by each of the variables.

Easily open variations as documents or add to open documents. If you hover the pointer over a variation, a check box appears. Click the check box to select that variation. When at least one check box is selected, a Contextual Task Bar appears. Click Open to open the variation as a new Photoshop document, or click Add To to add the variation to an open Photoshop document as a layer.

Edit the timeline. Other buttons on the Contextual Task Bar, or that appear on a variation when you hover over it, offer other options such as liking, downloading, or deleting an image. A filter icon at the top lets you constrain the list to certain criteria; for example, you can filter the timeline to show you only images you liked.



Popular questions about generative AI

Generative AI is unlike most other software features because it raises many questions across a number of areas that aren't technical. This is largely because generative AI is not a simple program or algorithm. The fact that generative AI is trained on millions of images causes people to ask questions such as:

- Did the creators of the images in the training set give permission to use their images for generative AI training?
- Are the creators of the images in the training set compensated for the use of their images?
- Can generative AI images be used in commercial jobs?
- Is there a way to tell if generative AI was used to falsify part or all of an image?

Adobe Firefly generative AI and Photoshop address those questions as explained below so that you can create with confidence.

How rights are cleared for the training images

Generative imagery is created by training software models using large numbers of images. Some AI services may train using found images without securing appropriate usage rights. Rights issues may lead to legal liability, so some companies and organizations may avoid using work created by services that can't provide information on training image rights. Adobe Firefly generative AI is designed to be “commercial safe” in part because it's trained using images where usage rights are known, such as images from the Adobe Stock collection and images in the public domain. (Note: In the United States, the term *public domain* has a specific legal definition involving the intentional release or normal expiration of copyright and is not the same as a copyrighted image being publicly viewable online.) For more information, see helpx.adobe.com/firefly/faq.html#training-data.

Adobe does not train on any Creative Cloud subscriber's personal content.

At the enterprise level, Adobe offers intellectual property indemnity for Adobe Firefly. If you or an enterprise client are interested in more details about Firefly indemnity, do a web search for the document “Firefly Legal FAQs – Enterprise Customers” and download the one with the most recent date.

Compensating contributors to the training set

Adobe Stock is one of the sources used to train Firefly, and Adobe Stock images come from voluntary contributors. Submitting images to Adobe Stock requires agreeing to terms that give Adobe permission to create and train Firefly models with those images. In addition, an Adobe Stock bonus compensation plan provides a way for Adobe Stock contributors to be paid for the use of their images for generative AI training. For more information, see: helpx.adobe.com/stock/contributor/help/firefly-faq-for-adobe-stock-contributors.html

Detecting the use of generative AI

Another issue is being able to determine whether an image is original or contains generative AI content. Adobe is part of an industry-wide effort called the Content Authenticity Initiative (contentauthenticity.org). This includes an effort to create an open, global standard for sharing image metadata (information) that can include creator attribution, includes generative AI transparency (letting people know that generative AI was used for at least part of the image), and is tamper-evident (so you can know if the metadata was altered).

Adobe is developing a Content Credentials feature that supports the Content Authenticity Initiative. For more information and links about how Content Credentials work and how they relate to Photoshop, see helpx.adobe.com/creative-cloud/help/content-credentials.html.

For example, if you use Firefly generative AI in an image and choose File > Export > Export As, a Content Credentials section at the bottom right corner of the Export As dialog box tells you that a Content Credential will automatically be applied and lets you preview what it will say if someone else decides to inspect the credential.

Exploring the possibilities

This lesson is only an introduction to the power of Firefly generative AI. As you learn to use it, you'll probably think of more ways to use it to brainstorm, visualize, and possibly create finished art.

Remember that generative AI doesn't have to be completely synthetic. You can combine it with other images and photographs in Photoshop, and you can generate AI images where your own creativity still comes through. For example, you can apply a Reference Image of your work to a prompt, or you can generate an image and then stylize it yourself using Photoshop brushes as you did in Lesson 10. Have fun!

About Neural Filters

● **Note:** Adobe may update Neural Filters after this book is published, so the filter list and options you see may depend on the version of Photoshop you use.

● **Note:** Some Neural Filters may be labeled Beta, which means they function but are still under development. You can use them, but when the finished version is released, those filters may produce different results or some options may be different.

Neural Filters are similar to generative AI but are more constrained and focused on specific tasks. To use them, choose Filter > Neural Filters. A list of filters appears; none is applied until you enable the toggle switch for a filter. It may be necessary to download some filters before using them. When a filter is enabled and selected, its options appear to the right of the filter list, and a large preview is to the left of the filter list. Some examples of Neural Filters are:

Smart Portrait can do things like change a smile or which ways eyes are looking.

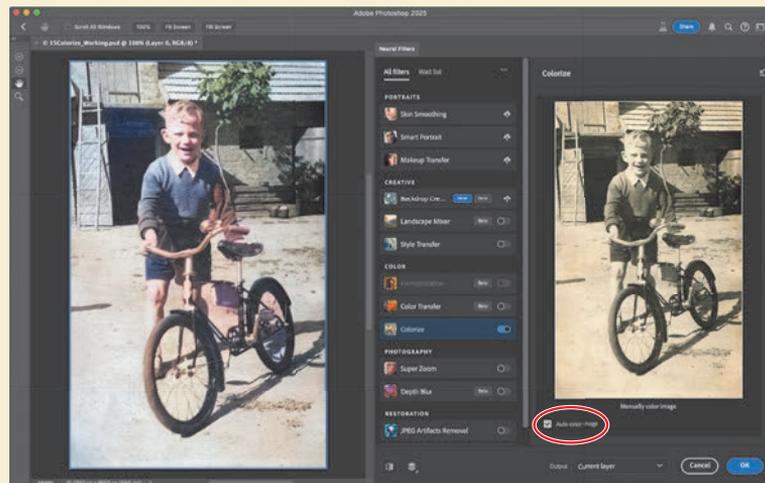
Photo Restoration can quickly remove defects such as dust, creases, and scratches, and enhance old portraits.

Harmonization can help visually blend layers to look more consistent.

Super Zoom can apply AI upscaling to create a higher resolution enlargement from a low resolution source image, with better quality than traditional upsampling.

At the bottom of the Neural Filters dialog box, the Output menu lets you use the results in different ways, such as a rendered layer, a Smart Filter, or a new document.

Neural Filters can be a lot of fun to play with, and may help you solve specific image editing challenges.



The Colorize Neural Filter is a quick way to add color to a scan of an old monochrome photograph.

Review questions

- 1 Where in Photoshop can you find generative AI features?
- 2 What feature/command name creates an entirely new picture (instead of altering an existing picture)?
- 3 What are at least three ways to improve a generative AI result that isn't quite right?
- 4 How can you make a generative AI result more like your own personal creative style?
- 5 Why are Adobe Firefly generative AI images called "commercial safe"?

Review answers

- 1 You can find generative AI features in the Contextual Task Bar (under certain conditions), on the Edit menu, and on the options bar when some tools are selected.
- 2 Generate Image.
- 3 You can select a different variation, change the prompt text, apply effects, and apply a reference image.
- 4 Apply a reference image using an image that represents your personal style.
- 5 Adobe Firefly images are trained on images where the rights either have been secured or are not an issue because the images are legally in the public domain.

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