How to Use Google Gemini's Models & Features

This document provides a comprehensive overview of Google Gemini's AI models and features, detailing their capabilities, typical use cases, best features, and needs met.

Introduction to Generative AI and Large Language Models (LLMs)

Generative AI is a type of artificial intelligence that can create new content, such as text, images, or music, by learning patterns from vast amounts of data. It predicts what should come next based on what it has learned. For example, if you ask a generative AI to write a story, it will use its knowledge of stories and language to create one.

Large Language Models (LLMs) are a common type of generative AI, trained on massive amounts of text from various sources like books and websites. LLMs can answer questions, write essays, and even chat like a human. They predict the best possible response by analyzing the words or phrases provided. LLMs are useful for tasks such as writing emails, translating languages, or summarizing long articles. The more data an AI model has, the better it becomes at understanding and producing high-quality content.

Gemini Models and Their Capabilities

Model	What it Does	Typical Use Cases	Best Features
Gemini 2.5 Pro	Google's most advanced and intelligent model. Handles complex reasoning, advanced coding, and multimodal understanding. Features "Deep Think" mode for step-by-step reasoning.	"Analyze this large dataset of scientific papers and identify emerging trends in AI ethics." "Debug this complex Python codebase and suggest optimizations." "Generate a comprehensive business plan..."	Enhanced thinking and reasoning, multimodal understanding, advanced coding, complex problems, analyzing large datasets/codebases/documents.

Gemini 2.5 Flash	Balances price and performance. Fast and versatile, good for a wide variety of tasks. Offers well-rounded capabilities.	"Summarize this long article into key bullet points." "Draft an email to a client regarding a project delay." "Generate creative ideas for a social media campaign."	Fast performance on complex tasks, cost efficiency, low latency, general use, chatbots, data extraction, text summarization.
Imagen 4	State-of-the-art image generation model.	"Generate a photorealistic image of a futuristic cityscape at sunset." "Create a whimsical illustration of a cat wearing a top hat."	High-quality image generation, better text rendering in images, speed.
Veo 1	State-of-the-art video generation model with native audio support.	"Generate a short video scene of a bustling market with appropriate background sounds and character dialogue." "Create a visual and audio representation of a serene forest, including..."	High-quality video generation, native audio generation (sound effects, background noises, dialogue).

Gemini Features

Tool / Feature	What it Does	Typical Use Cases	Best Features
Upload Files	Gemini 2.5 Pro allows you to provide Gemini with various types of files and documents as input for an analysis, summarization, or to use as context for generating responses.	Analyzing lengthy reports, summarizing research papers, getting descriptions of images, creating quizzes from study guides.	Directly ingests external data; supports a wide range of file types; provides context directly into Chat and relevant AI interactions. Documents (PDF, DOCX, TXT, CSV,

			JPG, PNG, MP4, MP3, etc.).
Deep Research	An agentic feature that browses the web to generate detailed, thorough findings, and creates comprehensive reports. Can analyze uploaded files.	In-depth market research, competitive analysis, scientific literature review, and comprehensive reports from various online sources and user-provided documents.	Automatically searches, reasons, and synthesizes information; generates cited reports; can incorporate user-provided files; creates Audio Overviews. A prompt describing the topic for the report, a PDF for images, or text files for the documents.
Canvas	An interactive workspace for collaborating with Gemini to brainstorm ideas, write text, code, and other creative projects.	Drafting blog posts/essays, coding prototypes (HTML, Python), brainstorming ideas, creating wireframes for app development, and transforming research into visualizable code.	Real-time collaboration with AI, interactive text and code editors (with preview for web apps), easy export to Google Docs, Sheets, Slides, Colab, infographics, web pages, and audio summaries of code. A prompt describing the task, a blank canvas to start with, or a blank canvas with pre-existing content.

Gemini Live	Real-time audio and video interactions with Gemini, allowing for natural back-and-forth conversations.	Troubleshooting appliances, getting personalized shopping advice, discussing travel plans, and getting real-time ideas with tasks.	Hands-free interaction; camera and screen sharing for visual input; integrated with your device's Calendar, Tasks, Keep. Android or iOS device; a microphone and camera.
Audio Overview	Transforms documents, slides, and web pages into concise, engaging, podcast-style audio overviews with AI-hosts.	Quickly consume long reports or research papers, and listen through a conversational summary, multimodal learning.	AI-generated podcast-style discussions; custom voice options; playback accessible on web and mobile; shareable and downloadable. An uploaded document/web page URL; Advanced subscription (for longer and more languages).
Code Generation & Editing	Generates code snippets, debugs existing code, and translates between programming languages. Supports various programming languages and frameworks for code generation.	Quickly generate code for web apps, automate data analysis, debug and optimize code, learn programming languages, and create efficient algorithms.	Streamlined process from idea to working code, real-time feedback, preview for web app prototypes, and templates for popular programming languages. A clear prompt describing the desired code, its functionality, or existing code to debug.

Import Code	Allows you to paste or upload existing code for Gemini. Gemini interface for further assistance, debugging, or further development.	Getting help with debugging a script, understanding a complex code snippet, refactoring legacy code, and migrating code from one language to another.	Directly provides context for code-related queries; supports various programming languages; enables rapid iteration on existing projects. Existing code (text, or file upload) for larger projects.
Multimodality	Ability to understand and generate text, images, audio, and video inputs. Combines them in responses.	Analyzing images and providing descriptions, transcribing audio and summarizing conversations, generating images from text descriptions, and creating videos from text and images.	Processes and integrates multiple types of data simultaneously; allows for more natural and comprehensive interactions. Inputs can include text, images, audio, video; depending on the specific model's capabilities.
Long Context Window	Allows the model to process a large amount of information within a single prompt, leading to more accurate and detailed responses.	Analyzing lengthy legal documents, summarizing academic papers, and summarizing long conversations, working with extensive research materials.	Provides the model with a deeper understanding of complex topics; improves accuracy and relevance of outputs for large inputs. Large text, audio, or video inputs (up to 1M tokens for Gemini 2.5 Pro and 2.5 Flashy).

Instructions for Beginners:

Here are step-by-step instructions on how to use Gemini for novices:

Step 1: Sign Up or Log In

- **Visit the Gemini website:** Go to gemini.google.com
- **Sign Up or Log In:** If you don't have a Google account, you'll need to create one. If you already have an account, log in with your Google credentials.

Step 2: Accessing Gemini

- **Start a Conversation:** Once logged in, you'll typically see a text box at the bottom of the screen where you can type your questions or requests.

Step 3: Entering a Prompt

- **Think of Your Request:** What do you need help with? This could be a question, a request for information, or something you'd like Gemini to do, like writing a short story or summarizing an article.
- **Type Your Prompt:** In the text box, type your question or task clearly. For example:
  - "What are the causes of climate change?"
  - "Can you help me write a short story about a dragon?"

Step 4: Gemini Responds

- **Read the Response:** Once you send your prompt by pressing "Enter" or clicking the send button, Gemini will generate a response based on what it knows.
- **Clarify if Needed:** If the answer isn't exactly what you're looking for, you can ask follow-up questions or clarify your prompt. For example, you can say, "Can you explain it in simpler terms?" or "Can you give more examples?"

Step 5: Experiment and Refine Your Prompts

- **Experiment with Different Prompts:** Don't be afraid to try different kinds of questions or requests. Gemini can help with a variety of tasks, such as:
  - Asking for advice or ideas.
  - Writing emails, essays, or stories.
  - Explaining complex topics in simple language.
- **Refine Your Prompts for Better Results:** If the response isn't quite right, try rephrasing your question or being more specific. For example, instead of asking "Tell me about animals," you can ask, "Can you describe the habitat of a polar bear?"

Step 6: End the Conversation

- **Sign Out:** Once you're done using Gemini, you can simply close the browser tab. If you want to log out of your Google account, you can do so through your Google account settings.

Effective Prompting:

To enhance the effectiveness of your interactions with Gemini, consider employing the following prompt formats, each tailored to different objectives:

Zero-Shot Prompting:

- **Purpose:** Directly request information or tasks without providing examples.
- **Example:** "Translate the following English sentence into French: 'Hello, how are you today?'"

Few-Shot Prompting:

- **Purpose:** Provide a few examples within the prompt to guide the model's response.
- **Example:**
  - Translate the following English sentences into French:
    - "Good morning, everyone."
    - "What time does the train depart?"
    - "Can you recommend a good restaurant?"

Chain-of-Thought Prompting:

- **Purpose:** Encourage step-by-step reasoning to arrive at a solution.
- **Example:**
  - Solve the math problem: What is 15% of 200?
  - Let's think step by step:
    - 15% is the same as 0.15.
    - Multiply 0.15 by 200: 0.15 * 200 = 30.
  - Therefore, 15% of 200 is 30.

Role-Playing Prompting:

- **Purpose:** Assign a specific role to Gemini to simulate different perspectives or expertise.
- **Example:** "As a travel advisor, suggest a 3-day itinerary for a family visiting Tokyo, including must-see attractions and dining options."

Reflexion Prompting:

- **Purpose:** Prompt the model to reflect on its own responses or consider alternative viewpoints.

- **Example:** "After providing your initial answer, evaluate its strengths and weaknesses, and suggest any improvements."

Tree-of-Thought Prompting:

- **Purpose:** Guide the model to explore multiple possible solutions or paths before converging on the best answer.
- **Example:** "When planning a marketing strategy for a new product, consider various approaches such as social media campaigns, influencer partnerships, and traditional advertising. Discuss the potential benefits and drawbacks of each."

By incorporating these prompt formats, you can tailor your interactions with Gemini to achieve more accurate and contextually appropriate responses.

Examples and Exercises

Below are prompt examples to showcase Gemini's diverse capabilities across its models and features. Each example is accompanied by a structured prompt format to aid students in learning effective prompting techniques.

For All Gemini Users (General Capabilities):

Creative Storytelling:

- **Prompt Format:**
  - [Role] As a [storyteller/novelist], create a [genre] story that [specific plot point or theme].
  - [Constraints] Limit the story to [word count] words.
  - [Tone] Maintain a [desired tone, e.g., humorous, suspenseful] tone throughout.
- **Example:**
  - [Role] As a storyteller, create a fantasy story that revolves around a young wizard discovering a hidden realm.
  - [Constraints] Limit the story to 300 words.
  - [Tone] Maintain a whimsical and adventurous tone throughout.
  - *This prompt encourages Gemini to generate a short, imaginative tale, demonstrating its creative writing abilities.*

Historical What-If Scenario:

- **Prompt Format:**
  - [Role] As a historian, analyze the potential outcomes if [historical event] had occurred differently.
  - [Analysis] Discuss the possible impacts on [specific aspects, e.g., politics,

culture].

- **Example:**
  - [Role] As a historian, analyze the potential outcomes if the Library of Alexandria had never been destroyed.
  - [Analysis] Discuss the possible impacts on global knowledge dissemination and technological advancement.
  - *This exercise showcases Gemini's ability to engage in speculative historical analysis.*

Language Learning Assistance:

- **Prompt Format:**
  - [Role] As a language tutor, assist in learning [target language] by [method, e.g., translating sentences, explaining grammar].
  - [Content] Provide [number] examples with explanations.
- **Example:**
  - [Role] As a language tutor, assist in learning Spanish by translating common English phrases and explaining the grammar behind them.
  - [Content] Provide 5 examples with brief explanations.
  - *This demonstrates Gemini's utility in educational and language learning contexts.*

Idea Generation for Creative Projects:

- **Prompt Format:**
  - [Role] As a brainstorming assistant, generate [number] unique ideas for [creative project, e.g., short film plots, art concepts].
  - [Criteria] Ensure ideas are [specific criteria, e.g., original, thought-provoking].
- **Example:**
  - [Role] As a brainstorming assistant, generate 3 unique ideas for short film plots that explore the concept of time travel.
  - [Criteria] Ensure ideas are original and thought-provoking.
  - *This illustrates Gemini's capability to aid in creative brainstorming sessions.*

For Users of Gemini 2.5 Pro (Advanced Capabilities):

Advanced Technical Explanation:

- **Prompt Format:**
  - [Role] As an expert in [field, e.g., quantum physics], explain [complex concept] in simple terms.
  - [Level] Tailor the explanation for an audience with basic understanding of the subject.

- **Example:**
  - [Role] As an expert in quantum physics, explain the concept of superposition in simple terms.
  - [Level] Tailor the explanation for an audience with basic understanding of physics.
  - *This prompt leverages Gemini's enhanced capabilities in delivering complex information accessibly.*

Business Strategy Development:

- **Prompt Format:**
  - [Role] As a business consultant, develop a strategic plan for [business type] aiming to [goal, e.g., expand market reach].
  - [Components] Include [specific elements, e.g., market analysis, marketing strategies].
- **Example:**
  - [Role] As a business consultant, develop a strategic plan for a local coffee shop aiming to expand its market reach.
  - [Components] Include market analysis, marketing strategies, and customer retention plans.
  - *This demonstrates Gemini's ability to assist in business planning and strategy formulation.*

In-Depth Comparative Analysis:

- **Prompt Format:**
  - [Role] As an analyst, compare and contrast [item A] and [item B] in terms of [criteria, e.g., performance, cost].
  - [Depth] Provide a detailed analysis with supporting data.
- **Example:**
  - [Role] As an analyst, compare and contrast electric cars and hybrid cars in terms of environmental impact and cost-effectiveness.
  - [Depth] Provide a detailed analysis with supporting data.
  - *This showcases Gemini's capacity for detailed comparative studies.*

Personalized Learning Plan Creation:

- **Prompt Format:**
  - [Role] As an educational planner, create a personalized learning plan for [learner's profile, e.g., a high school student interested in computer science].
  - [Plan] Include recommended courses, resources, and extracurricular activities.
- **Example:**

- [Role] As an educational planner, create a personalized learning plan for a high school student interested in computer science.
- [Plan] Include recommended courses, online resources, and relevant extracurricular activities.
- *This illustrates Gemini's ability to tailor educational content to individual needs.*

For Canvas Users:

Collaborative Story Writing:

- **Scenario:** Collaboratively write a short story with Gemini, utilizing Canvas's real-time editing features.
- **Steps:**
  - Open Canvas and start a new document titled "The Enchanted Forest."
  - In the first section, write an introduction setting the scene in a mystical forest.
  - Invite Gemini to continue the story, adding a plot twist where the forest comes alive.
  - Edit and refine the story collaboratively, adding dialogue and descriptive elements.
  - Finalize the story, ensuring coherence and engagement.
  - *This exercise demonstrates Canvas's collaborative writing capabilities.*

Code Collaboration:

- **Scenario:** Work with Gemini in Canvas to develop a Python script that analyzes text sentiment.
- **Steps:**
  - In Canvas, start a new code block titled "Sentiment Analysis Script."
  - Write the initial import statements for necessary libraries (e.g., nltk, textblob).
  - Collaborate with Gemini to write functions that preprocess text data.
  - Develop the main function that performs sentiment analysis on sample text.
  - Test the script with various text inputs and refine based on feedback.

Gemini Resources:

- **Gemini Help Center:** This page provides official help, including FAQs, and guides on using Gemini.
- **Google AI Website:** This is the main website for Google AI, where you can find more information about Gemini, other AI models, and the research behind them.
- **Gemini Release Notes:** This page contains the latest updates, features, and improvements made to Gemini, along with detailed release notes.