

Understand Class Genie's answers in Blackboard

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 This article is designated for all users.

About

After submitting a question, Class Genie returns an AI-generated answer using one of two formats: **flashcards** or a structured **text** answer. This article walks you through the different formats and how to use them.

No matter the answer format, Genie's responses always include:

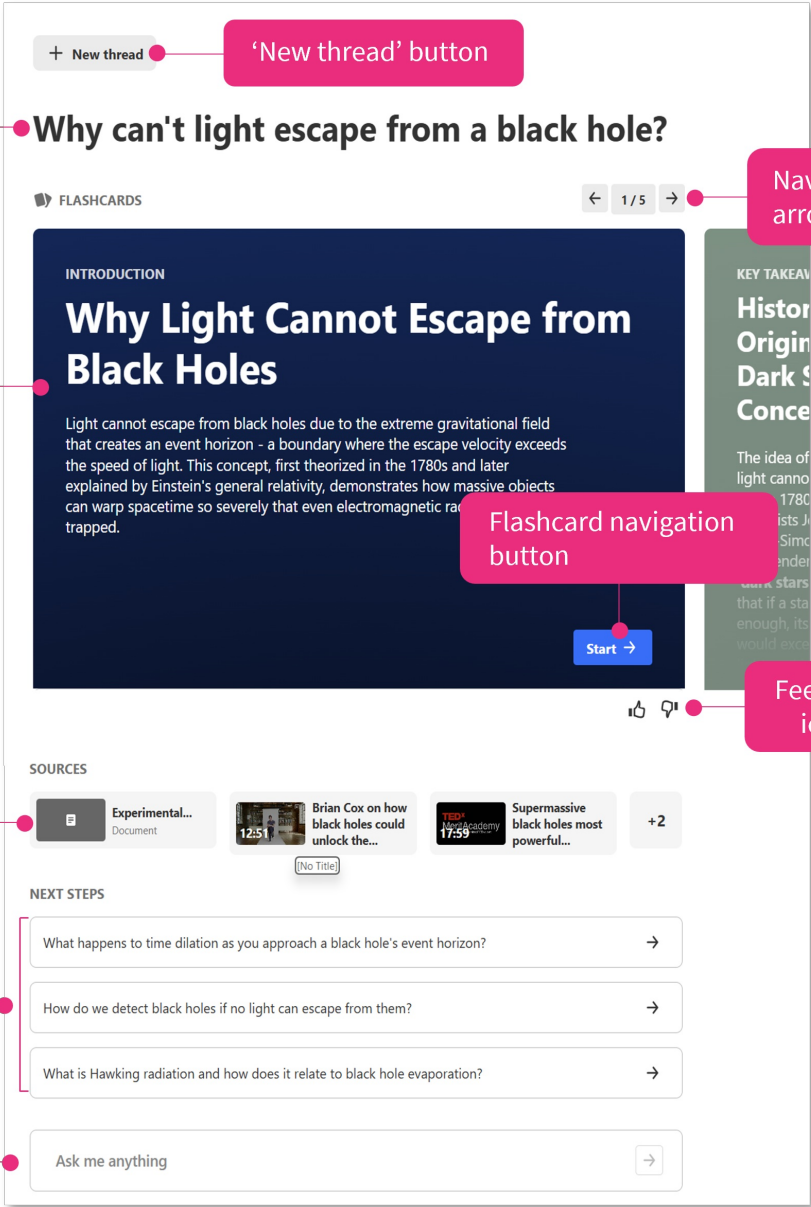
- A summary of how your question was interpreted
- Links to all the sources Genie used for building the answer
- Suggested follow-up questions ('Next Steps')
- Feedback options
- Threaded responses – If you ask follow-up questions, Genie keeps them in the same conversation thread. Each response appears under its question, with its own sources, feedback, and follow-up suggestions.



Genie also supports **multilingual** answers. It detects the language you used in your question and returns responses in that same language when possible.

Flashcard answers

Flashcards highlight key takeaways from your organization's verified content.



Search query • Why can't light escape from a black hole?

'New thread' button

Navigation arrows

AI generated flashcard

Flashcard navigation button

Feedback icons

'Sources' section

Suggested follow-up questions

'Ask me anything' field

Flashcard content:

INTRODUCTION

Why Light Cannot Escape from Black Holes

Light cannot escape from black holes due to the extreme gravitational field that creates an event horizon - a boundary where the escape velocity exceeds the speed of light. This concept, first theorized in the 1780s and later explained by Einstein's general relativity, demonstrates how massive objects can warp spacetime so severely that even electromagnetic radiation is trapped.

KEY TAKEAWAYS

Historical Origin of Dark Matter Concept

The idea of light cannot escape from black holes was first theorized in the 1780s by John Michell. He suggested that if a star was massive enough, its gravity would be so strong that light could not escape.

SOURCES

- Experimental... Document
- Brian Cox on how black holes could unlock the... (No Title)
- Supermassive black holes most powerful... (TEDx)
- +2

NEXT STEPS

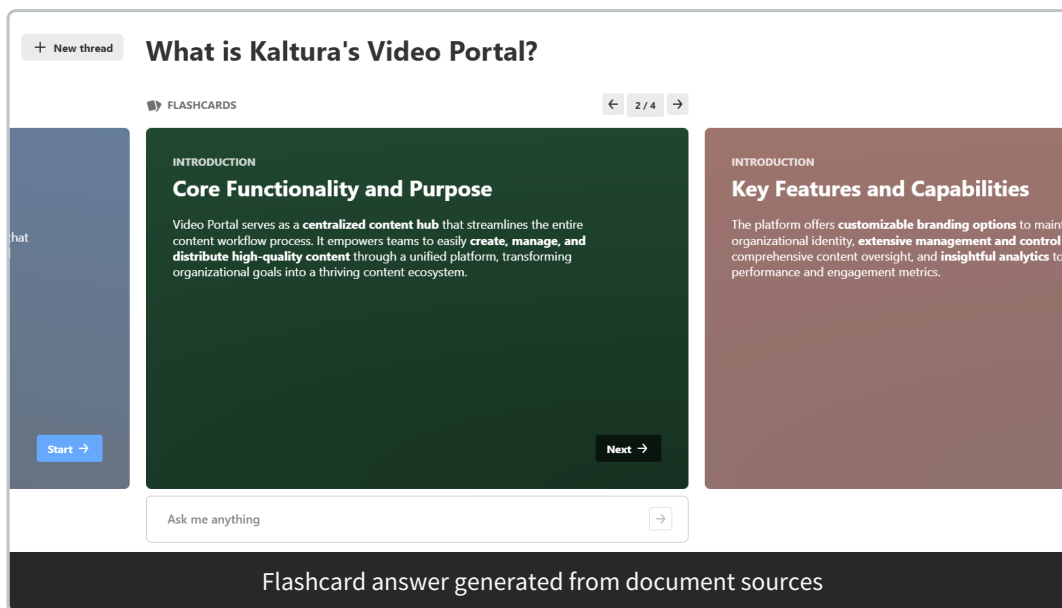
- What happens to time dilation as you approach a black hole's event horizon? →
- How do we detect black holes if no light can escape from them? →
- What is Hawking radiation and how does it relate to black hole evaporation? →

'Ask me anything' field

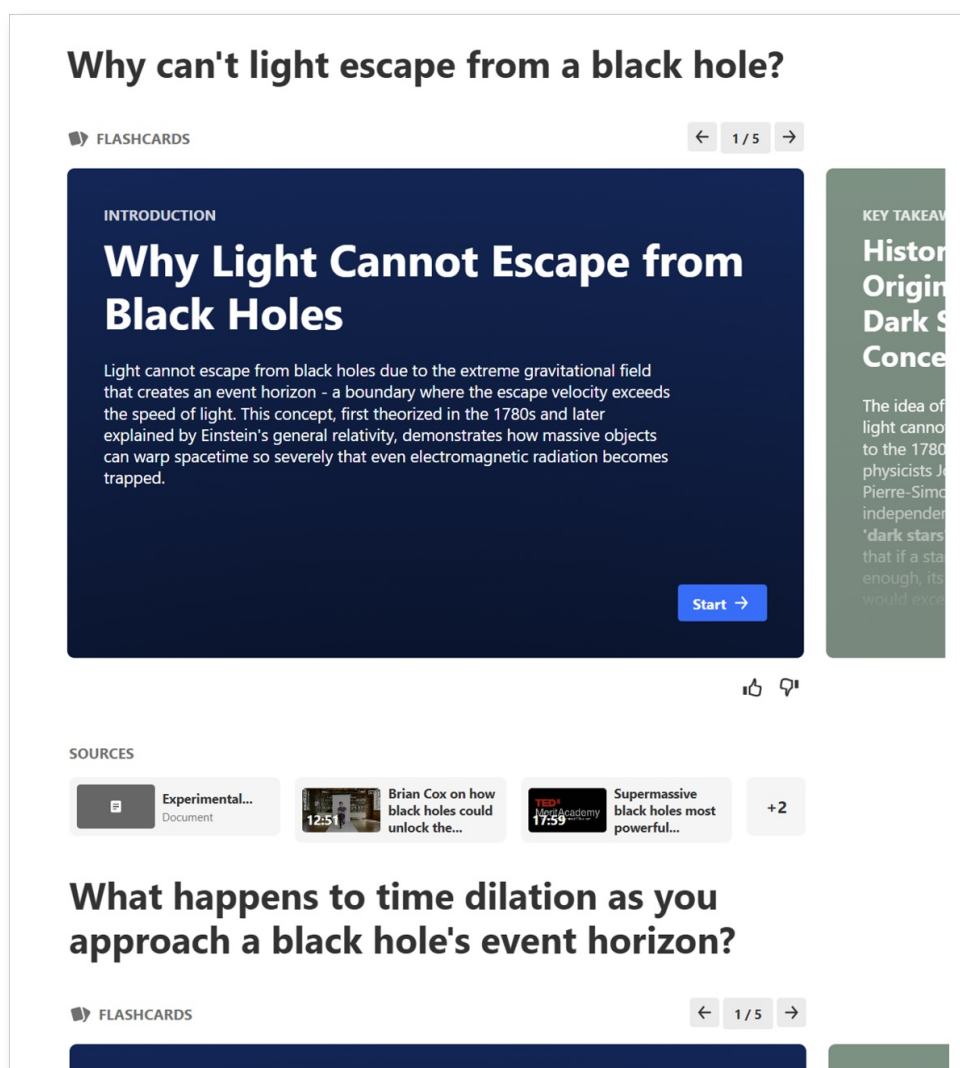
Ask me anything →

Each card may include:

- A short summary or answer to part of your question
- Video clips with a play button you can click
- Document excerpts (PDF, PPTX, DOCX)
- Images captured from video using OCR (on-screen text)



When you ask a follow-up question, Genie continues the conversation **in the same thread**, as shown in the image below. Each flashcard set will display under its corresponding question, and sources will be listed for each response individually.



INTRODUCTION

Time Dilation Near Black Hole Event Horizons

Time dilation becomes extreme as you approach a black hole's event horizon, with time appearing to slow down dramatically from an external observer's perspective and eventually stopping at the horizon itself, while the infalling observer experiences normal time flow until reaching the singularity.

Start →

KEY TAKEAWAYS

External Observer Perspective: Time Stops at Event Horizon

From the perspective of an external observer, time appears to slow down dramatically as an object approaches a black hole's event horizon, eventually appearing to stop at the horizon itself. At the event horizon, time stops for the external observer.

SOURCES

02:02:40

Faster than Light Speed The Physics of the Warp...

01:56:30

An Odyssey Through the Warped Side of...

12:51

Brian Cox on how black holes could unlock the...

+2

NEXT STEPS

What would happen to your body due to tidal forces as you fall into a black hole? →

How does the size of a black hole affect the strength of time dilation effects? →

Can anything ever truly escape from inside a black hole's event horizon? →

Ask me anything →

How to navigate flashcards

1. Click the **Start** button to begin viewing flashcards
2. Use the arrow buttons at the top of the card to move between cards
3. Click **Watch Full Video** or **Go to Source** to view the original content

How do scientists detect different types of black holes using gravitational waves?

FLASHCARDS

← 1/7 →

INTRODUCTION

Gravitational Wave Detection of Different Black Hole Types

Scientists use different gravitational wave detectors to observe various types of black holes based on their mass ranges and the frequencies they produce. Ground-based detectors like LIGO are optimal for stellar-mass black holes, while space-based detectors like LISA will target intermediate and supermassive black holes.

Start →

Ask me anything



KEY TAKEAWAYS

Ground-based detectors like LIGO are optimal for stellar-mass black holes.

LIGO, Virgo ground-based interferometers are several kilometers long and detect gravitational waves in the frequency range of several hundred to thousands of Hertz. This matches the frequency range of stellar-mass black holes.



The first card is always an introduction and does not include a video clip

Text answers

In some cases, Genie will return a written answer instead of flashcards. These are typically used for more descriptive or step-based questions and appear as a single, scrollable response.

Text answers are structured for easy reading and may include lists or tables. They're built from the same trusted sources and can include feedback options, links to sources, and follow-up suggestions, just like flashcards.

Text answers also support threaded conversations. Each new answer appears below the previous one, with separate sources and feedback options for every response.

Summarize the evidence astronomers use to detect black holes even though we can't see them directly

Evidence for Black Holes: How Astronomers Detect the Invisible

- **High-speed gas motion:** Astronomers observe hot glowing gas moving at tremendous speeds - up to several percent of the speed of light - far faster than normal stellar motions around supermassive black holes
- **Energy release:** This gas spiraling into black holes releases enormous amounts of energy equivalent to 100 million supernova explosions
- **Efficiency:** The energy output is so immense that it can only be explained by matter falling into a black hole, where gravitational potential energy converts to radiation more efficiently than even nuclear reactions

Gravitational Wave Detection

- **LIGO interferometry:** These instruments detect ripples in spacetime created when two black holes spiral into each other and merge
- **Waveform analysis:** By analyzing the characteristic patterns - increasing frequency and amplitude as black holes accelerate toward collision - astronomers determine masses, distances, and other properties with remarkable precision
- **Direct proof:** The first detection (GW150914) provided conclusive evidence that binary black holes exist and behave exactly as Einstein's general relativity predicts
- **Multiple detections:** Since 2015, dozens of such mergers have been detected, confirming stellar-mass black holes throughout the universe

Direct Imaging of Event Horizons

- **Event Horizon Telescope:** This collaboration captured the first image of a black hole's shadow in galaxy M87, showing the dark silhouette surrounded by glowing gas
- **Visual confirmation:** These images provide direct visual evidence of the event horizon's existence
- **Testing predictions:** The images allow astronomers to test theoretical predictions about black hole structure and behavior in unprecedented detail
- **Complex interpretation:** While challenging to analyze due to the physics of surrounding matter, these observations represent a breakthrough in black hole research

SOURCES


Supermassive black holes most powerful...

An Odyssey Through the Warped Side of...

Brian Cox on how black holes could unlock the...
+3

NEXT STEPS

→

→

→

→

'Sources' section

Search query

Feedback icons

'Ask me anything' field

Suggested follow-up questions

Below is an example of an answer in a table format:

+ New thread

Create a table comparing black hole types

I need to search for information about black hole types to create an accurate comparison table for you. Let me search for more comprehensive information about black hole classifications and their characteristics. Let me search for more specific information about primordial black holes and their characteristics. Based on the information from the knowledge base, I can create a comprehensive comparison table of black hole types. Here's the table:

Black Hole Types Comparison

Type	Mass Range	Formation Mechanism	Location/Examples	Key Characteristics
Stellar-Mass	3-20 times the mass of the Sun	Collapse of massive stars during supernova explosions	Throughout galaxies, detected by LIGO	- Form when giant stars die - Core collapses under its own weight - Most common type detected by gravitational wave observatories
	100-100,000	Chain reaction collisions in star clusters	Centers of dense	"Missing link" between stellar and supermassive - Difficult to detect

Ask me anything

Text answer in table format

Threaded experience

Genie keeps your conversation organized by displaying follow-up answers directly below your original question. When a new answer is added, the system automatically scrolls to the latest response, unless you're viewing an earlier part of the thread, in which case scrolling pauses so you don't lose your place.

+ New thread

Create a table comparing black hole types

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Ask me anything

AI-generated content may contain errors or omissions.

Example of a thread that includes flashcards and text answers

Provide feedback

Providing feedback on Genie's responses plays a crucial role in improving its accuracy and future recommendations. You can rate any answer using the **thumbs up** or **thumbs down** icons.

1. Click the icon to open the feedback window.

of black holes based on their mass ranges and the frequencies they produce. Ground-based detectors like LIGO are optimal for stellar-mass black holes, while space-based detectors like LISA will target intermediate and supermassive

Tell us more

Provide additional feedback

Cancel
Submit

2. Add an optional comment if you'd like
3. Click **Submit** to send your feedback

Once submitted, you can't edit or resubmit feedback for that answer.
