

Black Holes

Black holes in space are hard to see. But some black holes, especially super big ones, stand out. They gather bright rings of gas and other material.

This year, a world-spanning network of observatories, called the Event Horizon Telescope (EHT), zoomed in on a huge galaxy called M87 to create the first-ever photograph of a black hole.



First Black Hole Photo

This super huge black hole is about 55 million light-years away in a galaxy called M87.

While the existence of black holes was first discussed by Albert Einstein and other scientists a little more than 100 years ago, it wasn't until this April that a photograph of one was taken.

Don't Let the Name Black Hole Fool You!

A black hole is not empty. Rather, it is a great amount of matter packed into a very small area — think of a star ten times more massive than the sun squeezed into a sphere approximately the diameter of New York City. Packing all that matter into one little space causes a huge **gravitational field** so strong that nothing, not even light, can escape.



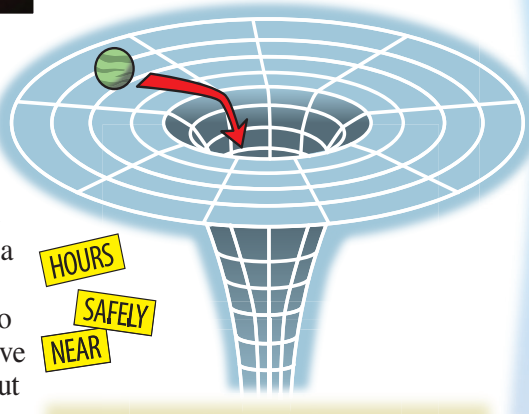
It would be like squashing all the bricks, concrete, steel, wood and glass of a large building into a tiny ball smaller than the size of a pea.

Katie Bouman, a 29-year old graduate student, came up with the math and made it possible for the EHT to capture the first photo of a black hole!

Black Holes and Time

Replace the missing words.

If an **SPACESHIP** **PASSED** **ASTRONAUT** was able to get close to a black hole and spend a few **HOURS** there, a strange thing would happen when he or she returned to their **NEAR** **SAFELY**. Many years might have **NEAR** in Earth time while the astronaut was **NEAR** the black hole!



What is a black hole?

When a star implodes, it collapses in on itself. The tremendous gravity of this can create a black hole.

A whirlpool in water is similar in some ways to a black hole. Both have a core that sucks in whatever is close by, which in a black hole includes light.



Spaghettification

What do noodles and spaghetti have to do with black holes? The closer one gets to a black hole, the stronger the pull of its gravity. As the gravity pulls things towards the black hole, they get stretched out like a long piece of spaghetti. That's called **spaghettification**, or the noodle effect.

Here's what a carrot might look like during spaghettification.



Draw what you think these things might look like if they went through spaghettification.



Extra! Extra! What's the area?

Area is the measure of how much space there is on a flat surface. Practice calculating area by measuring the sides of photographs in the newspaper. To find the area, multiply the length by the height.

Standards Link: Math: Measurement: Measure using standard units.

Libraries are Here to Help You!

Do you ever struggle with your homework? Libraries to the rescue! Most libraries have after-school programs to give one-on-one help to students. A tutor or a volunteer will provide personal help with a school assignment. Some libraries offer online help. And for students that perhaps do not have internet access at home, some libraries provide reference sources suitable for students.

Kid Scoop Puzzler

The words black and hole are often used in **compound words**. Those are words created by combining two smaller words. Use the words floating in space to create compound words by combining them with either the word **BLACK** or the word **HOLE**.

BLACK	KNOT	HOLE
BLACKTOP	SMITH	POTHOLE
_____	TOP	_____
_____	BLOW	_____
_____	SINK	_____
BOARD	ARM	POT
BERRIES	PORT	MAIL
BIRD		

Double Double Word Search

Find the words in the puzzle. How many of them can you find on this page?

T	E	L	E	S	C	O	P	E
L	N	P	U	L	L	V	L	B
R	T	O	I	E	Y	E	I	O
N	S	G	Z	X	M	N	H	E
E	H	B	A	I	T	T	T	E
T	C	L	T	I	R	W	A	S
N	A	A	P	R	O	O	M	T
G	E	C	P	R	E	I	H	A
T	E	K	K	S	U	P	E	R

Standards Link: Letter sequencing. Recognized identical words. Skim and scan reading. Recall spelling patterns.

FROM THE Kid Scoop LESSON LIBRARY

Exclamation Points!

Count all the exclamation points you can find in each section of the newspaper. Graph your results. Which section has the most? Why do you think this is?

Standards Link: Math: Students summarize and display data.

What do you get if you cross a space alien and a hot drink?

ANSWER: Grav-teal!

Write On! Ticket to Space

Pretend you could win a ride into space on a rocket. Write a paragraph telling why you should win that prize.



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