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Level 6 – 13th April, 2019

Astronomers release first ever photo of black hole

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<https://breakingnewsenglish.com/1904/190413-black-hole.html>

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Please try Levels 4 and 5 (they are easier).

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THE ARTICLE

From <https://breakingnewsenglish.com/1904/190413-black-hole.html>

Astronomers have taken the first ever photograph of a black hole. It is located in a far, distant galaxy called M87, which is 500 million trillion km from Earth. That gargantuan number is a five followed by twenty zeroes. Scientists estimate the black hole to have a diameter of 40 billion km and to be three million times larger than our planet. Lead astronomer Professor Heino Falcke spoke to the BBC about the black hole. He said: "What we see is larger than the size of our entire Solar System. It has a mass 6.5 billion times that of the Sun. And it is one of the heaviest black holes that we think exists. It is an absolute monster - the heavyweight champion of black holes in the Universe."

The image of the black hole was captured by an array of eight linked telescopes called the Event Horizon Telescope (EHT). No single telescope exists that is powerful enough to capture the image. Each of the EHT telescopes is located high up on volcanoes in Hawaii and Mexico, mountains in the USA and Spain, a desert in Chile, and in Antarctica. A team of 200 scientists pointed the networked telescopes towards the M87 galaxy and scanned it over a period of 10 days. The data they gathered was stored on hundreds of hard drives. It was then collated and processed to produce the image that is now a landmark in space exploration. Professor Sheperd Doeleman called it "an extraordinary scientific feat".

Sources: <https://www.bbc.com/news/science-environment-47873592>
<https://www.sciencenews.org/article/black-hole-first-picture-event-horizon-telescope>
<https://edition.cnn.com/2019/04/10/world/black-hole-photo-scn/index.html>

WARM-UPS

1. BLACK HOLES: Students walk around the class and talk to other students about black holes. Change partners often and share your findings.

2. CHAT: In pairs / groups, talk about these topics or words from the article. What will the article say about them? What can you say about these words and your life?

astronomer / black hole / galaxy / trillion / planet / solar system / champion / monster image / telescope / powerful / volcano / desert / hard drives / landmark / exploration

Have a chat about the topics you liked. Change topics and partners frequently.

3. SPACE EXPLORATION: Students A **strongly** believe space exploration is super-important; Students B **strongly** believe the opposite. Change partners again and talk about your conversations.

4. SPACE: What do you know about these things? What would you like to know? Complete this table with your partner(s). Change partners often and share what you wrote.

	What I Know	What I Want to Know
Black holes		
Galaxies		
Asteroids		
Solar systems		
Comets		
The Milky Way		

5. MILLION: Spend one minute writing down all of the different words you associate with the word "million". Share your words with your partner(s) and talk about them. Together, put the words into different categories.

6. SPACE: Rank these with your partner. Put the best at the top. Change partners often and share your rankings.

- Earth
- The sun
- The moon
- Mars
- Saturn
- Pluto
- Mercury
- Venus

VOCABULARY MATCHING

Paragraph 1

- | | |
|---------------|---|
| 1. astronomer | a. Complete and total. |
| 2. distant | b. An expert or student in the branch of science which deals with space objects, space, and the physical universe as a whole. |
| 3. galaxy | c. A straight line passing from side to side through the center of a circle or sphere. |
| 4. gargantuan | d. Far away in space or time. |
| 5. diameter | e. Huge; enormous; very, very, very big. |
| 6. entire | f. A system of millions or billions of stars, together with gas and dust, held together by the pull of gravity. |
| 7. absolute | g. With no part left out; whole. |

Paragraph 2

- | | |
|--------------|---|
| 8. captured | h. Took an image or photo of something or someone on a camera, telescope, etc. |
| 9. array | i. An achievement that requires great courage, skill, or strength. |
| 10. volcano | j. An ordered series or arrangement of things. |
| 11. data | k. An event, discovery, or change marking an important stage or turning point in something. |
| 12. collated | l. A mountain or hill that spits out fire and hot rocks. |
| 13. landmark | m. Facts and statistics collected together for reference or analysis. |
| 14. feat | n. Collected and combined to compare and analyze. |

BEFORE READING / LISTENING

From <https://breakingnewsenglish.com/1904/190413-black-hole.html>

1. TRUE / FALSE: Read the headline. Guess if a-h below are true (T) or false (F).

- a. The black hole is in a galaxy very near to us called M87. **T / F**
- b. The black hole has a diameter of 40 billion km. **T / F**
- c. The black hole is slightly smaller than our solar system. **T / F**
- d. An astronomer called the black hole a "heavyweight champion". **T / F**
- e. Scientists used 80 telescopes to capture the image of the black hole. **T / F**
- f. A telescope in Antarctica helped to capture the image of the black hole. **T / F**
- g. It took 10 days for the telescopes to provide the image. **T / F**
- h. A professor said the black hole would be made into a landmark on Earth. **T / F**

2. SYNONYM MATCH:

Match the following synonyms. The words in **bold** are from the news article.

- | | |
|----------------------|----------------------|
| 1. located | a. whole |
| 2. gargantuan | b. achievement |
| 3. estimate | c. complete |
| 4. entire | d. situated |
| 5. absolute | e. strong |
| 6. array | f. roughly calculate |
| 7. powerful | g. gathered |
| 8. pointed | h. enormous |
| 9. collated | i. aimed |
| 10. feat | j. formation |

3. PHRASE MATCH: (Sometimes more than one choice is possible.)

- | | |
|--|---------------------------|
| 1. It is located in a far, | a. is powerful enough |
| 2. That gargantuan number is a five followed | b. of 40 billion km |
| 3. have a diameter | c. hard drives |
| 4. larger than the size of our entire solar | d. linked telescopes |
| 5. the heavyweight champion | e. distant galaxy |
| 6. captured by an array of eight | f. towards the M87 galaxy |
| 7. No single telescope exists that | g. system |
| 8. scientists pointed the networked telescopes | h. of black holes |
| 9. stored on hundreds of | i. exploration |
| 10. a landmark in space | j. by twenty zeroes |

GAP FILL

From <https://breakingnewsenglish.com/1904/190413-black-hole.html>

Astronomers have taken the first (1) _____ photograph of a black hole. It is located in a far, distant (2) _____ called M87, which is 500 million trillion km from Earth. That (3) _____ number is a five followed by twenty zeroes. Scientists (4) _____ the black hole to have a diameter of 40 billion km and to be three million times larger than our planet. Lead (5) _____ Professor Heino Falcke spoke to the BBC about the black hole. He said: "What we see is larger than the size of our entire Solar System. It has a (6) _____ 6.5 billion times that of the Sun. And it is one of the heaviest black holes that we think exists. It is an absolute (7) _____ - the heavyweight (8) _____ of black holes in the Universe."

mass
galaxy
champion
estimate
ever
monster
gargantuan
astronomer

The image of the black hole was captured by an (9) _____ of eight linked telescopes called the Event Horizon Telescope (EHT). No single telescope exists that is powerful enough to (10) _____ the image. Each of the EHT telescopes is (11) _____ high up on volcanoes in Hawaii and Mexico, mountains in the USA and Spain, a (12) _____ in Chile, and in Antarctica. A team of 200 scientists pointed the networked telescopes towards the M87 galaxy and (13) _____ it over a period of 10 days. The data they gathered was stored on hundreds of (14) _____ drives. It was then collated and processed to produce the image that is now a landmark in space (15) _____. Professor Sheperd Doeleman called it "an extraordinary scientific (16) _____".

scanned
capture
exploration
array
feat
desert
hard
located

LISTENING – Guess the answers. Listen to check.

From <https://breakingnewsenglish.com/1904/190413-black-hole.html>

- 1) It is located in a far, distant _____ M87
 - a. galaxy scald
 - b. galaxies scold
 - c. galaxy called
 - d. galaxy cold
- 2) Scientists estimate the black hole to have _____ 40 billion km
 - a. a diameter off
 - b. a die a meter of
 - c. a diameter of
 - d. add a meter of
- 3) What we see is larger than the size _____ Solar System
 - a. off our in tire
 - b. of your entire
 - c. off our entire
 - d. of our entry
- 4) It has a mass 6.5 billion times _____ Sun
 - a. that of the
 - b. what of the
 - c. hat of the
 - d. sat of the
- 5) one of the heaviest black holes that we think exists. It is _____
 - a. an absolutely monsters
 - b. an absolute monster
 - c. an absolutes monster
 - d. an absolute monsters
- 6) The image of the black hole was captured by _____ eight linked telescopes
 - a. and a raid of
 - b. inner ray of
 - c. and a ray of
 - d. an array of
- 7) No single telescope exists that is powerful enough to _____ image
 - a. capture the
 - b. captures the
 - c. captured the
 - d. capsule the
- 8) The data they gathered was stored on _____ drives
 - a. hundreds of hardly
 - b. hundreds of hard
 - c. hundreds off hard
 - d. hundreds off hardly
- 9) It was then collated and processed to produce the image that is _____
 - a. know a land make
 - b. now a land mark
 - c. now a landmark
 - d. know a land make
- 10) Professor Sheperd Doeleman called it "an extraordinary _____"
 - a. scientific feet
 - b. scientific fleet
 - c. scientific feat
 - d. scientific float

LISTENING – Listen and fill in the gaps

From <https://breakingnewsenglish.com/1904/190413-black-hole.html>

Astronomers have taken (1) _____ photograph of a black hole. It is located in (2) _____ galaxy called M87, which is 500 million trillion km from Earth. That gargantuan number is a five followed by twenty zeroes. Scientists (3) _____ hole to (4) _____ of 40 billion km and to be three million times larger than our planet. Lead astronomer Professor Heino Falcke spoke to the BBC about the black hole. He said: "What we see is larger (5) _____ of our entire Solar System. It has a mass 6.5 billion times that of the Sun. And it is one of the heaviest black holes that we think exists. It is (6) _____ - the heavyweight champion of black holes in the Universe."

The image of the black hole was captured (7) _____ of eight linked telescopes called the Event Horizon Telescope (EHT). No single telescope exists that is powerful (8) _____ the image. Each of the EHT telescopes (9) _____ up on volcanoes in Hawaii and Mexico, mountains in the USA and Spain, (10) _____ Chile, and in Antarctica. A team of 200 scientists pointed the networked telescopes towards the M87 galaxy and scanned it over a period of 10 days. The data they gathered (11) _____ hundreds of hard drives. It was then collated and processed to (12) _____ that is now a landmark in space exploration. Professor Sheperd Doeleman called it "an extraordinary scientific feat".

COMPREHENSION QUESTIONS

From <https://breakingnewsenglish.com/1904/190413-black-hole.html>

1. What is the galaxy called in which the black hole is located?
2. How far is the black hole from Earth?
3. What part of the black hole is 40 billion km?
4. What is the black hole 6.5 billion times larger than?
5. What kind of champion did an astronomer call the black hole?
6. How many telescopes are part of the Event Horizon Telescope?
7. Where is the desert in which a telescope was located?
8. How many scientists were part of the team imaging the black hole?
9. For how long did the scientists point the telescopes at the black hole?
10. What did an astronomer call the image a landmark in?

MULTIPLE CHOICE - QUIZ

From <https://breakingnewsenglish.com/1904/190413-black-hole.html>

- 1) What is the galaxy called in which the black hole is located?
 - a) N68
 - b) N78
 - c) M87
 - d) M86
- 2) How far is the black hole from Earth?
 - a) 500 million trillion km
 - b) 500 million billion km
 - c) 500 million million km
 - d) 500 billion billion km
- 3) What part of the black hole is 40 billion km?
 - a) its center
 - b) its diameter
 - c) the circumference
 - d) its radius
- 4) What is the black hole 6.5 billion times larger than?
 - a) Saturn
 - b) our moon
 - c) the Sun
 - d) our solar system
- 5) What kind of champion did an astronomer call the black hole?
 - a) a worthy champion
 - b) a grand champion
 - c) a heavyweight champion
 - d) a great champion
- 6) How many telescopes are part of the Event Horizon Telescope?
 - a) 7
 - b) 8
 - c) 9
 - d) 10
- 7) Where is the desert in which a telescope was located?
 - a) Mongolia
 - b) Morocco
 - c) Alaska
 - d) Chile
- 8) How many scientists were part of the team imaging the black hole?
 - a) 150
 - b) 200
 - c) 250
 - d) 300
- 9) For how long did the scientists point the telescopes at the black hole?
 - a) two weeks
 - b) 10 days
 - c) a month
 - d) 0.15 milliseconds
- 10) What did an astronomer call the image a landmark in?
 - a) space exploration
 - b) the history books
 - c) the history of Earth
 - d) the Milky Way

ROLE PLAY

From <https://breakingnewsenglish.com/1904/190413-black-hole.html>

Role A – Earth

You think Earth is the most interesting space object. Tell the others three reasons why. Tell them why their objects aren't as interesting. Also, tell the others which is the least interesting of these (and why): the moon, Mars or the Sun.

Role B – The Moon

You think the moon is the most interesting space object. Tell the others three reasons why. Tell them why their objects aren't as interesting. Also, tell the others which is the least interesting of these (and why): Earth, Mars or the Sun.

Role C – Mars

You think Mars is the most interesting space object. Tell the others three reasons why. Tell them why their objects aren't as interesting. Also, tell the others which is the least interesting of these (and why): the moon, Earth or the Sun.

Role D – The Sun

You think the Sun is the most interesting space object. Tell the others three reasons why. Tell them why their objects aren't as interesting. Also, tell the others which is the least interesting of these (and why): the moon, Mars or Earth.

AFTER READING / LISTENING

From <https://breakingnewsenglish.com/1904/190413-black-hole.html>

1. WORD SEARCH: Look in your dictionary / computer to find collocates, other meanings, information, synonyms ... for the words 'black' and 'hole'.

black	hole

- Share your findings with your partners.
- Make questions using the words you found.
- Ask your partner / group your questions.

2. ARTICLE QUESTIONS: Look back at the article and write down some questions you would like to ask the class about the text.

- Share your questions with other classmates / groups.
- Ask your partner / group your questions.

3. GAP FILL: In pairs / groups, compare your answers to this exercise. Check your answers. Talk about the words from the activity. Were they new, interesting, worth learning...?

4. VOCABULARY: Circle any words you do not understand. In groups, pool unknown words and use dictionaries to find their meanings.

5. TEST EACH OTHER: Look at the words below. With your partner, try to recall how they were used in the text:

<ul style="list-style-type: none">• ever• followed• three• size• mass• champion	<ul style="list-style-type: none">• eight• single• high• team• hard• feat
--	--

BLACK HOLES SURVEY

From <https://breakingnewsenglish.com/1904/190413-black-hole.html>

Write five GOOD questions about black holes in the table. Do this in pairs. Each student must write the questions on his / her own paper.

When you have finished, interview other students. Write down their answers.

	STUDENT 1 _____	STUDENT 2 _____	STUDENT 3 _____
Q.1.			
Q.2.			
Q.3.			
Q.4.			
Q.5.			

- Now return to your original partner and share and talk about what you found out. Change partners often.
- Make mini-presentations to other groups on your findings.

BLACK HOLES DISCUSSION

STUDENT A's QUESTIONS (Do not show these to student B)

1. What did you think when you read the headline?
2. What images are in your mind when you hear the word 'black'?
3. What do you know about black holes?
4. What do you think of the name 'M87' for a galaxy?
5. How can scientists get an image from 500 million trillion km away?
6. What do you think of astronomy?
7. Why is it important to explore space?
8. What is a black hole?
9. What would you like to know about space?
10. Where would you like to travel in space?

Astronomers release first ever photo of black hole – 13th April, 2019
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BLACK HOLES DISCUSSION

STUDENT B's QUESTIONS (Do not show these to student A)

11. Did you like reading this article? Why/not?
12. What do you think of when you hear the word 'hole'?
13. What do you think about what you read?
14. Would you like to be an astronaut?
15. What experiences do you have with telescopes?
16. How did the universe begin?
17. Are there other planets that support life?
18. What do you know about our galaxy?
19. Should governments spend a lot more on space exploration?
20. What questions would you like to ask the professors?

DISCUSSION (Write your own questions)

STUDENT A's QUESTIONS (Do not show these to student B)

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____

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DISCUSSION (Write your own questions)

STUDENT B's QUESTIONS (Do not show these to student A)

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____

LANGUAGE - CLOZE

From <https://breakingnewsenglish.com/1904/190413-black-hole.html>

Astronomers have taken the first ever photograph of a black hole. It is located in a far, (1) _____ galaxy called M87, which is 500 million trillion km from Earth. That gargantuan number is a five (2) _____ by twenty zeroes. Scientists estimate the black hole to have a diameter of 40 billion km and to be three million times larger than our planet. Lead (3) _____ Professor Heino Falcke spoke to the BBC about the black hole. He said: "What we see is larger than the size of our (4) _____ Solar System. It has a (5) _____ 6.5 billion times that of the Sun. And it is one of the heaviest black holes that we think exists. It is an (6) _____ monster - the heavyweight champion of black holes in the Universe."

The image of the black hole was captured (7) _____ an array of eight linked telescopes called the Event Horizon Telescope (EHT). No (8) _____ telescope exists that is powerful (9) _____ to capture the image. Each of the EHT telescopes is located high up on volcanoes in Hawaii and Mexico, mountains in the USA and Spain, a desert in Chile, and in Antarctica. A team of 200 scientists (10) _____ the networked telescopes towards the M87 galaxy and scanned it over a period of 10 days. The data they (11) _____ was stored on hundreds of hard drives. It was then collated and processed to produce the image that is now a landmark in space exploration. Professor Sheperd Doeleman called it "an extraordinary scientific (12) _____".

Put the correct words from the table below in the above article.

- | | | | | |
|-----|----------------|---------------|------------------|----------------|
| 1. | (a) distance | (b) distant | (c) distanced | (d) distances |
| 2. | (a) follows | (b) followed | (c) following | (d) follower |
| 3. | (a) astrology | (b) astronomy | (c) astronomical | (d) astronomer |
| 4. | (a) all | (b) entire | (c) every | (d) completely |
| 5. | (a) lass | (b) bass | (c) pass | (d) mass |
| 6. | (a) everything | (b) afraid | (c) absolute | (d) entry |
| 7. | (a) by | (b) of | (c) at | (d) to |
| 8. | (a) alone | (b) solely | (c) single | (d) just |
| 9. | (a) plenty | (b) justly | (c) sufficient | (d) enough |
| 10. | (a) pointed | (b) garnered | (c) spun | (d) skied |
| 11. | (a) gathered | (b) greeted | (c) gated | (d) garnered |
| 12. | (a) feat | (b) feet | (c) fleet | (d) float |

SPELLING

From <https://breakingnewsenglish.com/1904/190413-black-hole.html>

Paragraph 1

1. located in a far, distant xaylga
2. That ragatnagu number
3. Scientists smieetta the black hole to have...
4. our etneir Solar System
5. that we think teisxs
6. It is an aboelust monster

Paragraph 2

7. an ayarr of eight linked telescopes
8. located high up on seanoocvl in Hawaii
9. over a direpo of 10 days
10. It was then ldaetocl and processed
11. space rtiopaexonl
12. an rerntaidxraoy scientific feat

PUT THE TEXT BACK TOGETHER

From <https://breakingnewsenglish.com/1904/190413-black-hole.html>

Number these lines in the correct order.

- () galaxy called M87, which is 500 million trillion km from Earth. That gargantuan number is a five followed
- () by twenty zeroes. Scientists estimate the black hole to have a diameter of 40 billion km and to be three million times larger
- () hole. He said: "What we see is larger than the size of our entire Solar System. It has a mass 6.5 billion
- () M87 galaxy and scanned it over a period of 10 days. The data they gathered was stored on hundreds of hard
- () times that of the Sun. And it is one of the heaviest black holes that we think
- () than our planet. Lead astronomer Professor Heino Falcke spoke to the BBC about the black
- () exists. It is an absolute monster - the heavyweight champion of black holes in the Universe."
- () image. Each of the EHT telescopes is located high up on volcanoes in Hawaii and Mexico, mountains
- () The image of the black hole was captured by an array of eight linked telescopes called the
- () drives. It was then collated and processed to produce the image that is now a landmark in space
- () Event Horizon Telescope (EHT). No single telescope exists that is powerful enough to capture the
- () exploration. Professor Sheperd Doeleman called it "an extraordinary scientific feat".
- () in the USA and Spain, a desert in Chile, and in Antarctica. A team of 200 scientists pointed the networked telescopes towards the
- (**1**) Astronomers have taken the first ever photograph of a black hole. It is located in a far, distant

PUT THE WORDS IN THE RIGHT ORDER

From <https://breakingnewsenglish.com/1904/190413-black-hole.html>

1. have first photograph . the ever Astronomers taken
2. distant It galaxy . in located a far, is
3. three larger than our Be times million planet .
4. than our Larger size the System . Solar of
5. one heaviest is holes . of black It the
6. of linked telescopes . an eight by array Captured
7. single powerful exists telescope enough . No that is
8. networked the the galaxy . towards Pointed telescopes M87
9. it 10 of Scanned over days . a period
10. the image landmark . a is that Produce now

CIRCLE THE CORRECT WORD (20 PAIRS)

From <https://breakingnewsenglish.com/1904/190413-black-hole.html>

Astronomers have taken the first ever photograph of a black hole. It is located in a far, *distance / distant* galaxy called M87, which is 500 million trillion km *from / near* Earth. That gargantuan *numeral / number* is a five followed by twenty zeroes. Scientists *estimate / guessing* the black hole to have a *diametric / diameter* of 40 billion km and to be three million times larger than our *plant / planet*. Lead astronomer Professor Heino Falcke spoke to the BBC about the black hole. He said: "What we see / *seen* is larger than the size of our *entire / entirety* Solar System. It has a mass 6.5 billion times that of the Sun. And it is one of the heaviest black holes that we think *existence / exists*. It is an *absolute / absolutely* monster - the heavyweight champion of black holes in the Universe."

The *image / imaged* of the black hole was captured by an *awry / array* of eight linked telescopes called the Event Horizon Telescope (EHT). No *singled / single* telescope exists that is powerful *sufficient / enough* to capture the image. Each of the EHT telescopes is located *highly / high* up on volcanoes in Hawaii and Mexico, mountains in the USA and Spain, a *dessert / desert* in Chile, and in Antarctica. A team of 200 scientists *pointed / appointed* the networked telescopes towards the M87 galaxy and *scanned / scammed* it over a period of 10 days. The data they gathered was stored on hundreds of hard drives. It was then *percolated / collated* and processed to produce the image that is now a landmark in space exploration. Professor Sheperd Doeleman called it "an extraordinary scientific *feat / feet*".

Talk about the connection between each pair of words in italics, and why the correct word is correct.

PUNCTUATE THE TEXT AND ADD CAPITALS

From <https://breakingnewsenglish.com/1904/190413-black-hole.html>

astronomers have taken the first ever photograph of a black hole it is located in a far distant galaxy called m87 which is 500 million trillion km from earth that gargantuan number is a five followed by twenty zeroes scientists estimate the black hole to have a diameter of 40 billion km and to be three million times larger than our planet lead astronomer professor heino falcke spoke to the bbc about the black hole he said what we see is larger than the size of our entire solar system it has a mass 65 billion times that of the sun and it is one of the heaviest black holes that we think exists it is an absolute monster the heavyweight champion of black holes in the universe

the image of the black hole was captured by an array of eight linked telescopes called the event horizon telescope eht no single telescope exists that is powerful enough to capture the image each of the eht telescopes is located high up on volcanoes in hawaii and mexico mountains in the usa and spain a desert in chile and in antarctica a team of 200 scientists pointed the networked telescopes towards the m87 galaxy and scanned it over a period of 10 days the data they gathered was stored on hundreds of hard drives it was then collated and processed to produce the image that is now a landmark in space exploration professor sheperd doeleman called it an extraordinary scientific feat.

PUT A SLASH (/) WHERE THE SPACES ARE

From <https://breakingnewsenglish.com/1904/190413-black-hole.html>

Astronomers have taken the first ever photograph of a black hole. It is located in a far, distant galaxy called M87, which is 500 million trillion km from Earth. That gargantuan number is a five followed by twenty zeroes. Scientists estimate the black hole to have a diameter of 40 billion km and to be three million times larger than our planet. Lead astronomer Professor Heino Falck spoke to the BBC about the black hole. He said: "What we see is larger than the size of our entire Solar System. It has a mass 6.5 billion times that of the Sun. And it is one of the heaviest black holes that we think exist. It is an absolute monster - the heavyweight champion of black holes in the Universe." The image of the black hole was captured by an array of eight linked telescopes called the Event Horizon Telescope (EHT). No single telescope exists that is powerful enough to capture the image. Each of the EHT telescopes is located high upon volcanoes in Hawaii and Mexico, mountains in the USA and Spain, a desert in Chile, and in Antarctica. A team of 200 scientists pointed the networked telescopes toward the M87 galaxy and scanned it over a period of 10 days. The data they gathered was stored on hundreds of hard drives. It was then collated and processed to produce the image that is now a landmark in space exploration. Professor Sheperd Doeleman called it "an extraordinary scientific feat".

HOMework

1. VOCABULARY EXTENSION: Choose several of the words from the text. Use a dictionary or Google's search field (or another search engine) to build up more associations / collocations of each word.

2. INTERNET: Search the Internet and find out more about this news story. Share what you discover with your partner(s) in the next lesson.

3. BLACK HOLES: Make a poster about black holes. Show your work to your classmates in the next lesson. Did you all have similar things?

4. SPACE EXPLORATION: Write a magazine article about more money being spent on space exploration. Include imaginary interviews with people who are for and against this.

Read what you wrote to your classmates in the next lesson. Write down any new words and expressions you hear from your partner(s).

5. WHAT HAPPENED NEXT? Write a newspaper article about the next stage in this news story. Read what you wrote to your classmates in the next lesson. Give each other feedback on your articles.

6. LETTER: Write a letter to an expert on black holes. Ask him/her three questions about them. Give him/her three of your opinions on research into black holes. Read your letter to your partner(s) in your next lesson. Your partner(s) will answer your questions.

ANSWERS

VOCABULARY (p.4)

1. b 2. d 3. f 4. e 5. c 6. g 7. a
8. h 9. j 10. l 11. m 12. n 13. k 14. i

TRUE / FALSE (p.5)

- a F b T c F d T e F f T g T h F

SYNONYM MATCH (p.5)

- | | |
|---------------|----------------------|
| 1. located | a. situated |
| 2. gargantuan | b. enormous |
| 3. estimate | c. roughly calculate |
| 4. entire | d. whole |
| 5. absolute | e. complete |
| 6. array | f. formation |
| 7. powerful | g. strong |
| 8. pointed | h. aimed |
| 9. collated | i. gathered |
| 10. feat | j. achievement |

COMPREHENSION QUESTIONS (p.9)

1. M87
2. 500 million trillion km
3. Its diameter
4. Our solar system
5. A heavyweight champion
6. Eight
7. Chile
8. 200
9. Ten days
10. Space exploration

WORDS IN THE RIGHT ORDER (p.20)

1. Astronomers have taken the first ever photograph.
2. It is located in a far, distant galaxy.
3. Be three million times larger than our planet.
4. Larger than the size of our Solar System.
5. It is one of the heaviest black holes.
6. Captured by an array of eight linked telescopes.
7. No single telescope exists that is powerful enough.
8. Pointed the networked telescopes towards the M87 galaxy.
9. Scanned it over a period of 10 days.
10. Produce the image that is now a landmark.

MULTIPLE CHOICE - QUIZ (p.10)

1. c 2. a 3. b 4. d 5. c 6. b 7. d 8. b 9. b 10. a

ALL OTHER EXERCISES

Please check for yourself by looking at the Article on page 2.
(It's good for your English ;-)