TheGuardianWeekly

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NASA gladly loses a spacecraft

Level 1 | Elementary

1 Key words

Fill the gaps using these key words from the text.

comet	orbit	crater	spacecraft
solar system	copper	mothership	enormous

1. _____ is a reddish-brown metal. Its chemical symbol is Cu.
2. The path which a planet or comet follows around the sun is called its _____ .
3. In space travel a _____ is a rocket that carries smaller rockets.
4. A _____ is a vehicle that travels through space.
5. A _____ is a ball of ice and dust that travels through space.
6. Volcanoes and explosions often leave a large round hole in the earth. This is called a _____ .
7. _____ means 'very, very big'.
8. The _____ consists of the sun and nine planets, including Earth.

2 Find the information

Look in the text and find this information as quickly as possible.

1. How far is Tempel 1 from Earth?
2. How much did the space mission to Tempel 1 cost?
3. How fast was the spacecraft travelling when it hit Tempel 1?
4. What was the name of the space mission?
5. How far was the mothership from the explosion?
6. What are the four organic elements mentioned in the text?

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Nasa gladly loses a spacecraft
By Tim Radford

For thousands of years comets have been a mystery to man. They travel across the sky very fast and have a bright 'tail' of burning gas. The comet Tempel 1 has an orbit far outside the orbit of the furthest planet in our solar system, Pluto. It has been there for 4.6 billion years, 133 million kilometres from Earth. Last week a little American spacecraft crashed into Tempel 1. The spacecraft had a camera and it took a photograph of the comet every minute before it finally crashed into its surface.

The space mission to Tempel 1 cost $335 million and was called Deep Impact. The spacecraft was travelling at 37,000 kilometres per hour when it hit the comet and the crash completely destroyed the spacecraft. But before it hit the comet, the spacecraft took some amazing photographs. The last one was a close-up picture which the spacecraft took just 3 seconds before it crashed into the comet.

"Right now we have lost one spacecraft," said a delighted NASA engineer. Deep Impact was like an American Independence Day fireworks display. It took many years to plan and ended in an enormous explosion.

The spacecraft which crashed into the comet was made of copper and was the size of a washing machine. It was dropped from a mothership into the path of the comet and the mothership then photographed the cloud of ice, dust and organic chemicals that rose from the surface of the comet after the crash.

The crash completely destroyed the spacecraft but nothing really happened to the comet: experts believe that the crash slowed the comet down by no more than 1/10,000th of a millimetre a second. The aim of the mission was to study for the first time the interior of a comet.

The mothership was 480km from the explosion and observed the crash and the explosion with instruments for 800 seconds. Seven satellites, including the Hubble space telescope, watched the moment of drama, and over the next day and night about 50 telescopes on Earth were watching the distant comet.

The first people to produce pictures in Britain were pupils from King's school, Canterbury. They used information from the 2m Faulkes telescope in Hawaii, a telescope used by schools. Scientists from the US and around the world were delighted. For the first time, they had clear and close-up pictures of a comet.

Comets like Halley's Comet which visit the Earth frequently are not so interesting for scientists. But comets like Tempel 1 are so distant that they could hold the secrets of the planets, the Earth's oceans and even of the original organic chemistry from which life developed. "If you are thinking of comets as possible sources of organic material, then you are looking for the organic elements carbon, hydrogen, oxygen, nitrogen," said John Zarnecki of the Open University.

For Andrew Coates of the Mullard space science laboratory of University College London, Deep Impact was a fantastic success. "You have the comet getting bigger and bigger in the field of view, the level of detail on the comet getting better and better," he said. "We know that comets produce jets. What we have now is the first artificial jet from a comet," he added. "The fact that there are craters tells us the surface must be solid in some way. This is going to be really exciting."

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3 Comprehension check

Match the beginnings and the endings of the sentences.

1. Scientists are very happy because …
2. Tempel 1 is interesting for scientists because …
3. The aim of the mission was …
4. Instruments on the mothership …
5. The last picture was taken …
6. Scientists know the surface of Tempel 1 must be solid because …

a. … its orbit is outside the solar system.
b. … studied the clouds of dust, ice and organic chemicals that rose from the surface.
c. … 3 second before the spacecraft hit the comet.
d. … they have close-up pictures of a comet for the first time.
e. … they can see craters.
f. … to study the interior of a comet for the first time.

4 Vocabulary 1 - Opposites

Find the words in the text that are the opposite of these words.

1. nearest _____
2. tiny _____
3. nearby _____
4. unhappy _____
5. unclear _____
6. rarely _____
7. boring _____
8. liquid _____

5 Vocabulary 2 - Game

Unscramble the letters to make words from the text.

1. tomce
2. pscae
3. tibor
4. tapnel
5. sismion
6. sceletope

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6 Grammar focus - Irregular past tenses

Complete the table.

1. take _____
2. rise _____
3. hold _____
4. tell _____
5. hit _____
6. say _____

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KEY

1 Key words

1. copper
2. orbit
3. mothership
4. spacecraft
5. comet
6. crater
7. enormous
8. solar system

2 Find the information

1. 133 million kilometres
2. $335 million
3. 37,000 kilometres per hour
4. Deep Impact
5. 480 kilometres
6. Carbon, hydrogen, oxygen, nitrogen

3 Comprehension check

1. d; 2. a; 3. f; 4. b; 5. c; 6. e

4 Vocabulary 1 – Opposites

1. furthest
2. enormous
3. distant
4. delighted
5. clear
6. frequently
7. exciting/interesting
8. solid

5 Vocabulary 2 – Game

1. comet
2. space
3. orbit
4. planet
5. mission
6. telescope

6 Grammar Focus – Irregular past tenses

1. took
2. rose
3. held
4. told
5. hit
6. said