

Unit 2 Watch this space ...

Synopsis

This video is about man's efforts to find out more about the universe. It begins with a summary of what we know about our Milky Way and raises the possibility that there might be intelligent life elsewhere in the universe. It goes on to talk about early attempts to detect intelligent life and then focuses on the Arecibo Observatory in Puerto Rico, the largest radio telescope in the world. It ends by talking about the *SETI@home* project which uses the ordinary desktop computers of millions of volunteers to analyse the data from the Arecibo Observatory.

Procedural notes

Before you watch

1

- Ask the students to look at the activity and check understanding of the first word as an example.
- Allow the students time to discuss the words with their partner, then check the answers with the class.

Possible answers

- 1 planet: a very large round object that moves around the Sun or another star
- 2 solar system: a star and the planets that go round it – for example, the Sun and the group of planets that includes the Earth
- 3 galaxy: an extremely large group of stars and planets – for example the Milky Way galaxy
- 4 comet: a bright object in space that has a tail of gas and dust
- 5 universe: space and everything that exists in it, including the Earth and all the other planets
- 6 observatory: a building with a telescope which scientists use to study the stars and planets
- 7 black hole: an area in outer space where the force of gravity is so strong that light and everything else around it is pulled into it
- 8 extraterrestrial: relating to things that exist on planets other than Earth

- 9 star: a very large hot ball of gas that appears as a small bright light in the sky at night
- 10 astronomer: someone who studies the stars and planets using scientific equipment such as telescopes

2

- Put the students into groups of three or four and present the activity.
- Allow the students time to discuss in pairs and monitor and support as necessary before leading a brief group discussion on the issues raised.

While you watch

3

- Ask the students to look at the activity and play the video.
- Then check the answers with the class.

Answers

- 1 ✓ ('Our planet belongs to a solar system which is one of around 200 billion others ...')
- 2 ✓ ('Our planet belongs to a solar system which is one of around 200 billion others ...')
- 3 ✓ ('Our planet belongs to a solar system which is one of around 200 billion others in the Milky Way galaxy.')
- 4 ✗
- 5 ✓ ('How many galaxies there are in the universe no one knows ...')
- 6 ✓ ('Once, in 1977, the Ohio State University Radio Observatory detected a signal from outer space ...')
- 7 ✗
- 8 ✓ ('... many people believe may have come from extraterrestrials.')
- 9 ✗
- 10 ✓ ('When the astronomer Dr Jerry Ehman first saw the signals ...')

4

- Present the comprehension activity and allow the students time to complete it. Avoid playing the video again at this stage unless necessary.
- Then check the answers with the class.

Answer

c

5

- Present the comprehension activity and allow the students time to read the sentences.
- Then play the video again and allow the students time to complete the activity individually, before checking their answers with a partner.
- Then check the answers with the class.

Answers

- 1 There are around **200 billion** solar systems in the Milky Way and our planet is part of one of them.
- 2 Astronomers detected a signal from outer space in **Ohio** in 1977.
- 3 The Arecibo Observatory in Puerto Rico has the **largest** radio telescope in the world.
- 4 The *SETI@home* project began in **1999**.
- 5 Over **5 million** people have joined the *SETI@home* project.

ALTERNATIVE

If the students find this exercise difficult, play the video in sections, stopping it after each answer. Or you could give them a copy of the script.

After you watch

6

- Present the language activity and allow the students time to complete it individually, before checking their answers with a partner.
- Then check the answers with the class.

Answers

Noun	Verb
analysis	analyse
assumption	assume
attachment	attach
combination	combine
consolation	console
detection	detect
donation	donate
fascination	fascinate

7

- Ask the students to look at the language activity and check the students' understanding of the task.
- Allow the students time to complete the activity individually or in pairs. Monitor and provide support as necessary.
- Then check the answers with the class.

Answers

- 1 attach
- 2 console
- 3 donation
- 4 assumption
- 5 combine
- 6 detect
- 7 analysis
- 8 fascination

ALTERNATIVE

If the students find this exercise difficult, give them a copy of the script to help them to work out the words in context.

8

- Present the activity and check the students' understanding of the task.
- Allow the students time to complete the activity in pairs. Monitor and support as necessary.
- If appropriate for your group, ask for a few volunteers to present their webinar to the rest of the class.

EXTRA: WRITING

Ask the students to design a promotional email for *SETI@home*, which will be sent out to potential volunteers. This should explain about the project and why people should get involved.

EXTRA: RESEARCH

Ask the students to find out more about *SETI@home* and what they have achieved so far. They should write a brief report to tell the class about at the next lesson.

Over to you**9**

- Put the students into groups of three or four.
- Present the activity to the class and check the students' understanding of the questions.
- Allow the students time to discuss. Monitor and note down any mistakes for error correction.
- Then lead a brief group discussion on the issues raised.

EXTRA: WRITING

Ask the students to write a story about man making contact with extraterrestrials. This would also work well as a homework activity.

Video script

Our planet belongs to a solar system which is one of around 200 billion others in the Milky Way galaxy. How many galaxies there are in the universe no one knows, but it's safe to assume that they number in their billions. Where once we thought ourselves to be the centre of all things, we now realise that our planet is just a tiny speck in a universe so large that we can barely comprehend it. One consolation – for some at least – is that the scale of the universe raises the possibility of there being intelligent life on other planets.

Such a possibility has fascinated scientists for centuries, and since the early days of radio we have been picking up signals from the cosmos and analysing them for signs of intelligent life. Once, in 1977, the Ohio State University Radio Observatory detected a signal from outer space that stood out from the rest, and which many people believe may have come from extraterrestrials. When the astronomer Dr Jerry Ehman first saw the signals presented as data on a print-out, he wrote one word in the margin. Afterwards, scientists repeatedly searched the same patch of sky hoping to see further signs of the 'Wow! signal', as it became known, but nothing was ever found. The search, however, continues.

This is the Arecibo Observatory in Puerto Rico. With an antenna over 300 metres in diameter, it is the largest radio telescope in the world. The problem for scientists is the amount of information to analyse. The receiver picks up hundreds of thousands of radio signals per second, and the computing power needed to read each signal is far beyond the capabilities of any individual machine.

It seemed an impossible task until 1999, when the *SETI@home* project began. *SETI@home* uses the ordinary desktop computers of millions of volunteers to analyse every piece of data from the Arecibo Observatory. Once the software is installed, it will run in the computer's downtime, like a screensaver. This means that anyone with a computer can take part in the search for alien life, without actually having to do anything themselves.

Volunteers are sent a piece of data from a small patch of sky. Their computers then spend a few days, during the times when they are not using it, analysing the radio signals from that data, looking for anything that could be evidence of intelligent life. The results are sent back to a research institute in California, then the data from a different patch of sky is sent and the process begins again.

In this way, millions of people are helping scientists to achieve the impossible dream of reading the universe. The volunteers' names are attached to each piece of data, so if signs of life do emerge in a patch of sky analysed by your computer, you will forever be associated with the first contact with aliens.

To date, over five million people have signed up for the *SETI@home* project, combining to make the biggest supercomputer the world has ever seen, and donating thousands of years-worth of computing time in the process. And while the *SETI@home* project hasn't yet produced evidence of intelligent life, there is still a huge amount of sky to analyse. The possibility remains; they could be out there, and it could be you who finds them.