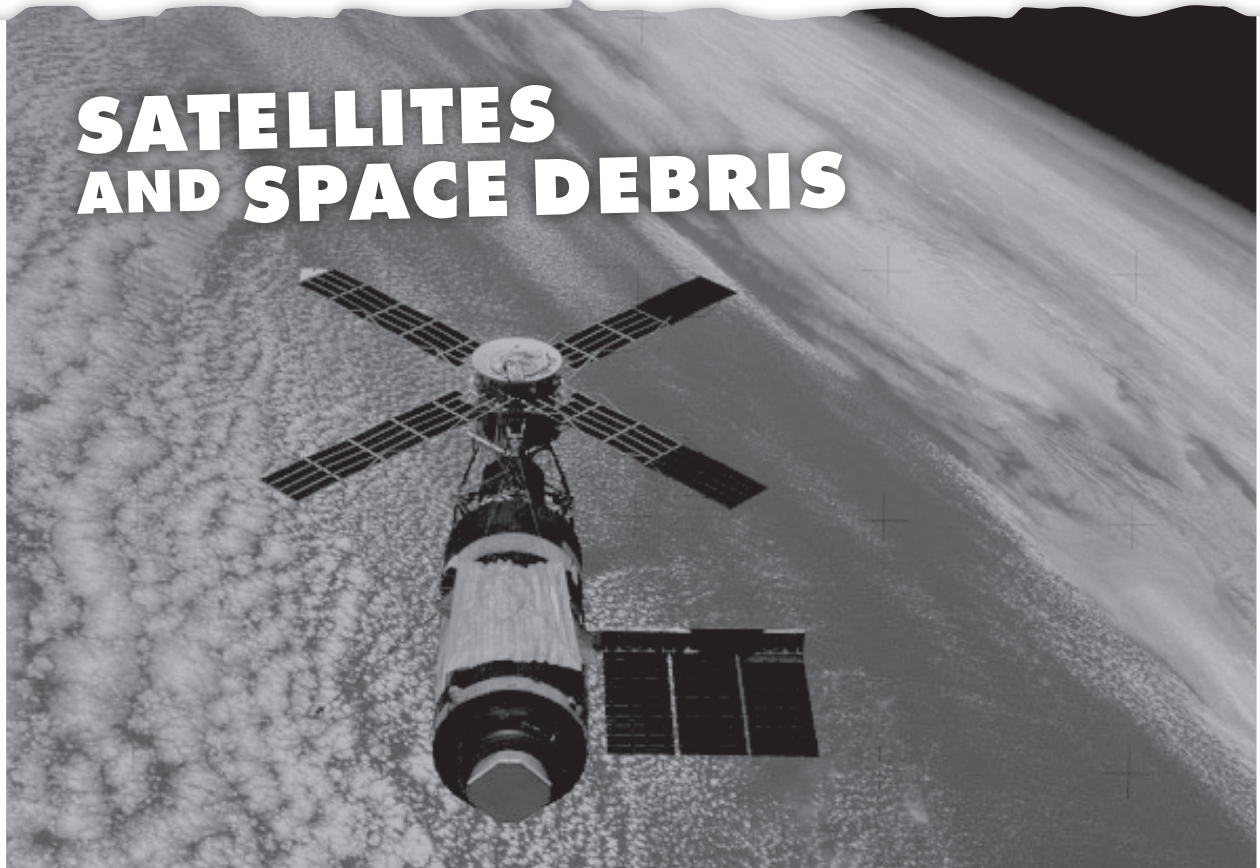


3 How do they do it?

2 READING

Read the article about satnavs on page 66 of the Student's Book and do exercises 2 and 3 there. Then read more about satellites below. How many active satellites are there in space?



SATELLITES AND SPACE DEBRIS

The Soviet Union launched the first satellite, Sputnik 1, on 4 October 1957. After that, at least ten countries launched a total of 6,600 of them. 3,600 satellites are still in orbit, and approximately 1,000 of these are active.

When satellites reach the end of their life, some fall into the Earth's atmosphere and burn up. However, there are more than half a million objects orbiting the Earth. Most of them are space debris: pieces of old satellites or launch vehicles. Some of these are small (5 cm in diameter) and some are very large. The *Envisat* is an old European Space Agency satellite which weighs 8,000 kilos!

The Oscar-winning movie *Gravity*, starring Sandra Bullock and George Clooney, shows what can happen when debris hits a space station. Space

debris travels at around 28,000 km/h, so even a small piece can badly damage a satellite.

Experts are taking this problem very seriously. In the USA, the National Aeronautics and Space Administration (NASA) tracks the debris carefully. When debris seems likely to hit a spacecraft, NASA changes its orbit. In Japan, scientists are developing a 700-metre-long magnetic net (like a fishing net), to catch debris.

In Switzerland, the Swiss Space Center is working on CleanSpace One. This is a special satellite which chases and catches old satellites. Working at a speed of 28,000 km/h, at a height of around 700 kilometres, it will hold the old satellite with a special arm. Then both satellites will fall into the atmosphere and burn up.

3 AFTER READING

True or false? Correct the false sentences about the *Satellites and space debris* text.

- 1** *3,000 satellites are no longer in orbit.*

- 2** *All satellites fall into the Earth's atmosphere and burn up.*

- 3** *Space debris is made up of over 500,000 small objects.*

- 4** *Space debris travels quite slowly.*

- 5** *NASA watches and follows space debris.*

- 6** *CleanSpace One uses a magnetic net to hold the other satellite.*

Now look at these sentences from the text. What do the words in *italics* refer to?

- 1** *Since then a number of countries launched a total of 6,600 of them.*

- 2** *When satellites reach the end of their life, some fall into the Earth's atmosphere and burn up.*

- 3** *Experts are taking this problem very seriously.*

- 4** *Working at a speed of 28,000 km/h, at a height of around 700 kilometres, it will hold the old satellite with a special arm.*

Now look at *Your response* on page 66 of the Student's Book.