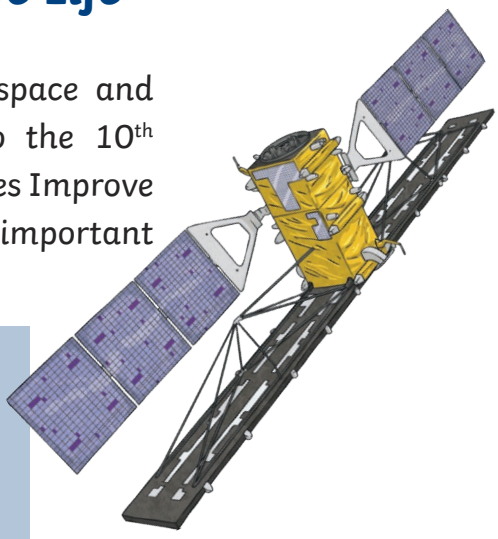
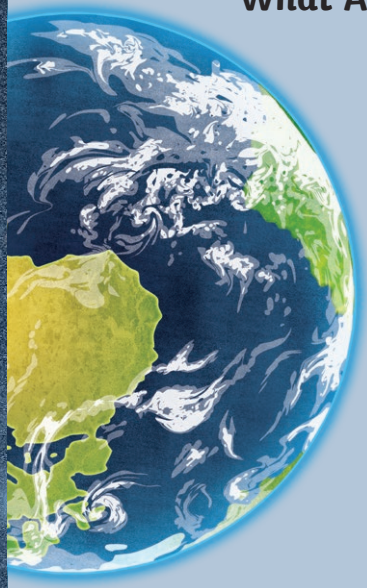
World Space Week 2020:
'Satellites Improve Life'

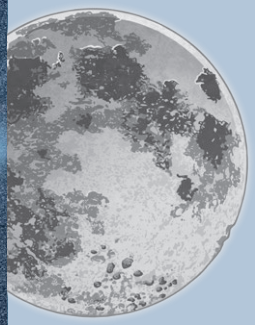
World Space Week is an annual celebration of space and technology which runs from the 4th October to the 10th October. The theme of the event for 2020 is 'Satellites Improve Life'. We may not realise it but satellites play an important part in much of what we do in our daily lives.



What Are Satellites?



Satellites are objects that **orbit** planets and stars in space. Satellites can be natural, such as moons and rocks or they can be artificial, which means that they have been made by humans. There are currently over 2,000 satellites orbiting the Earth. They can be used for communication or to gather useful information.

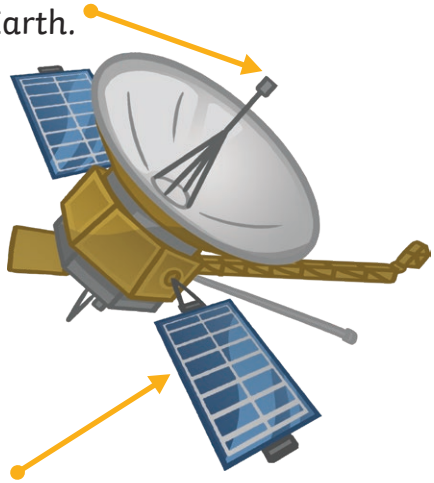


Some satellites can travel at around 17,000 miles per hour and they can be positioned hundreds of miles from the Earth's surface.

Artificial satellites come in a variety of different shapes and sizes but they all have at least two parts in common:

Antenna

An **antenna** is a metal rod that sends and receives information to and from Earth.



Power Source

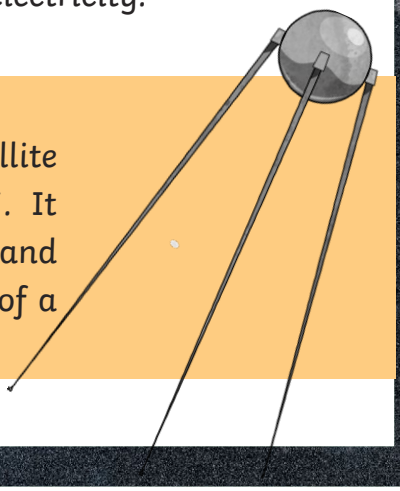
Most satellites use solar panels to convert sunlight into electricity.

Why Are Satellites Important?

Satellites send information back to Earth which is then used for many different purposes.

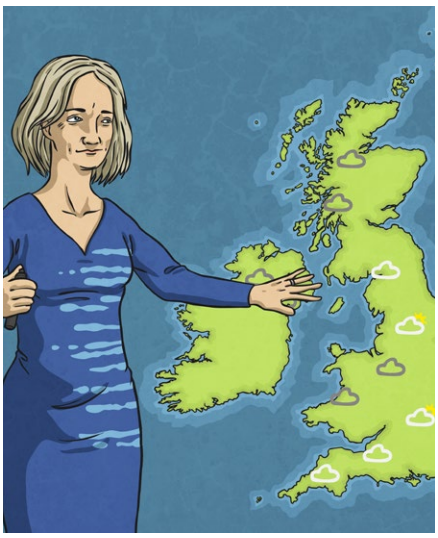
Did You Know...?

The first artificial satellite was launched in 1957. It was called 'Sputnik 1' and it was roughly the size of a large beach ball.



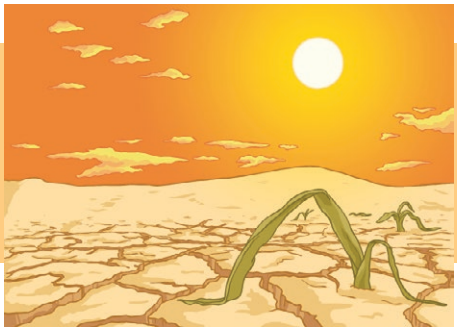
They Watch over Our Planet

Weather satellites track weather patterns and use these to create weather forecasts. This helps us to know what to expect from the weather each day.



By monitoring the planet, satellites can also warn us of upcoming natural disasters. This allows people more time to prepare for possible hurricanes, volcanic eruptions or flooding.

Satellites tell us a lot about climate change; they closely monitor changes to the ocean and to **glaciers**.



Did You Know...?

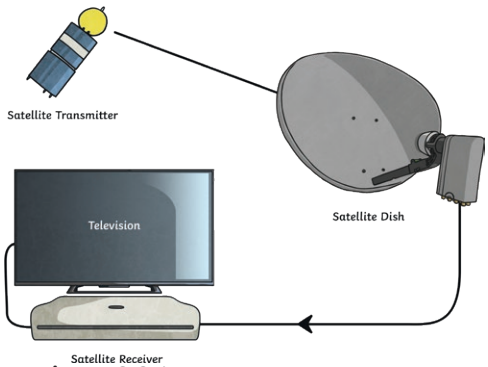
In 2013, satellites detected around 66 trillion gallons of water beneath the ground in Kenya: a country which suffers from many droughts.

They Keep Us Connected

Satellite phones can be used to make calls from almost anywhere in the world. Using satellites, satellite phones allow us to communicate when mobile phone networks are either overloaded or unavailable. This makes them useful in war zones or after natural disasters.

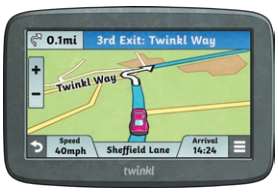
They Keep Us Entertained

The satellite dishes that we often see outside many homes are designed to receive signals from satellites in space. These signals are then converted by a receiver box into programmes that can be watched on television.



They Help Us to Get Around

Satellite navigation (or 'satnav') was first used in cars in 1996. It uses GPS (Global Positioning Systems) to navigate us to where we need to go without the need for printed maps. Now, many mobile phones have mapping apps which use GPS to help us to get around easily.



They Tell Us More about Outer Space

Before space travel, scientists could only use telescopes or the naked eye to explore the universe. In 1990, the Hubble Space Telescope was launched into orbit. It has photographed many new galaxies and moons and it has enabled humans to make many important scientific discoveries.

Glossary

antenna: A metal rod or wire that sends or receives signals.

glaciers: Large areas of ocean ice that can float around the Earth's poles.

orbit: To repeatedly travel around a star, a planet or a moon.

Questions

1. Roughly how many miles per hour can some satellites travel when in orbit? Tick one.
   - ◯ 170
   - ◯ 1,700
   - ◯ 17,000
   - ◯ 170,000

2. Draw **four** lines and complete each sentence.

Weather satellites...	can be used to make calls from almost anywhere in the world.
Mapping apps...	receive signals which are converted into television programmes.
Satellite dishes...	are used to create weather forecasts.
Satellite phones...	use GPS to help us to navigate around.

3. Look at the section called **They Watch over Our Planet**
   Find and copy a phrase which shows that satellites 'watch carefully'.

   _____

4. Fill in the missing word.

   Satellites tell us a lot about climate change by closely monitoring any changes to the ocean and to _____.

5. In which section of the text would you find information about the Hubble Space Telescope?

   _____

6. Explain where you think the name 'satellite dish' comes from.

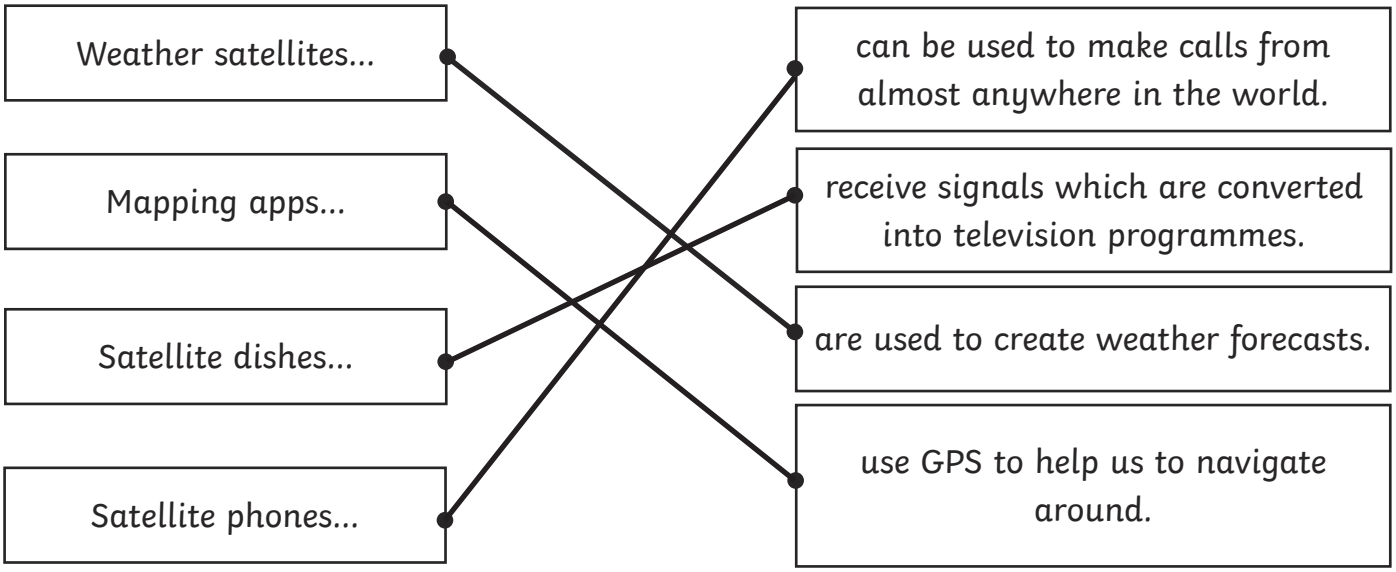
7. Explain why mobile phone networks might be overloaded following a natural disaster.

8. **The theme of the event for 2020 is 'Satellites Improve Life'.**
   Discuss why you think satellites improve life.

Questions

1. Roughly how many miles per hour can some satellites travel when in orbit? Tick one.
   - ○ 170
   - ○ 1,700
   - ✓ **17,000**
   - ○ 170,000

2. Draw **four** lines and complete each sentence.



3. Look at the section called **They Watch over Our Planet**
   Find and copy a phrase which shows that satellites 'watch carefully'.
   closely monitor

4. Fill in the missing word.

   Satellites tell us a lot about climate change by closely monitoring any changes to the ocean and to **glaciers.**

5. In which section of the text would you find information about the Hubble Space Telescope?
   The section of the text that I would find information about the Hubble Space Telescope in is 'They Tell Us More about Outer Space'.

6. Explain where you think the name 'satellite dish' comes from.
   Pupils' own responses, such as: They are probably called satellite dishes because they use satellites to receive signals and they are shaped like dishes.

7. Explain why mobile phone networks might be overloaded following a natural disaster
   Pupils' own responses, such as: After a natural disaster, lots of people may want to call their loved ones or contact the emergency services. This may mean more people using their phones at the same time which overloads the network.

8. **The theme of the event for 2020 is 'Satellites Improve Life'.**
   Discuss why you think satellites improve life.
   Pupils' own responses, such as: I think that satellites improve life by making it easier to keep in touch with other people and to navigate around. They also help us to learn more about Earth and space and they can even help to save lives.

World Space Week 2020:
'Satellites Improve Life'

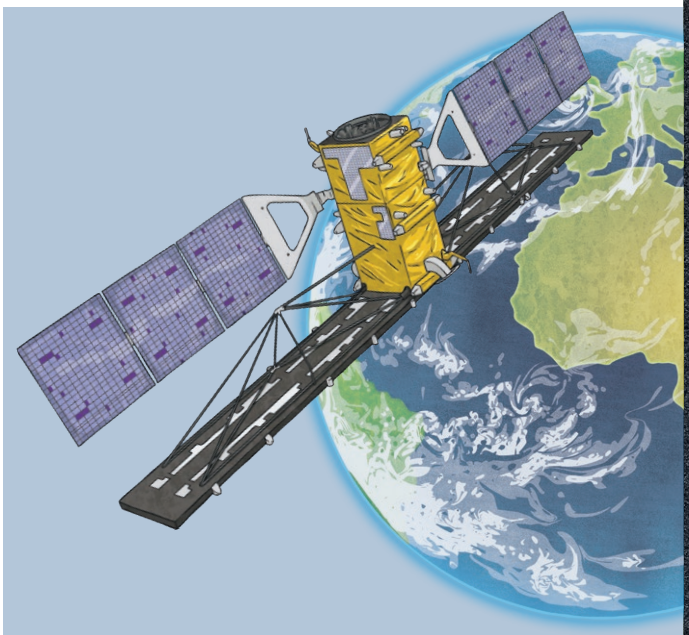
World Space Week is an annual celebration of space and technology which runs from the 4th October to the 10th October. The theme of the event for 2020 is 'Satellites Improve Life'. Satellites play a vital role in our modern lives and, whether we realise it or not, much of what we do in a day relies on satellite technology.

What Is a Satellite?

Satellites are objects that **orbit** planets and stars in space. Satellites can be natural, such as moons and rocks or they can be humanly-constructed (artificial). They can be used for communication or to gather useful information.

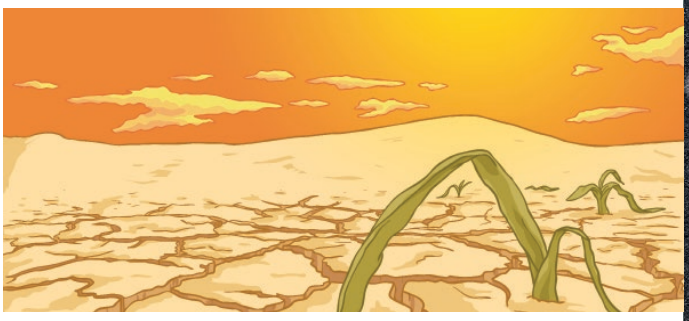
The first artificial satellite, Sputnik 1, was approximately the size of a large beach ball and was launched in 1957. Artificial satellites come in a variety of shapes and sizes but they can usually be identified by their large solar panels and an antenna. Many modern satellites create power by using solar panels to convert sunlight into electricity. A satellite's antenna transmits information to and from Earth.

Satellites are positioned hundreds of miles from the Earth's surface. They need both gravity and speed to be able to stay in orbit and some can travel at around 17,000 miles per hour.



Why Are Satellites Important?

Satellites transmit information back to Earth which can be used in countless different ways, many of which we may not even realise. For example, online mapping tools use satellites to allow us to see most places in the world in 3D.



They Watch Over Our Planet

Weather satellites track weather patterns and this information is then used to create weather forecasts. This helps us to be prepared for what to expect when we step outside each day.

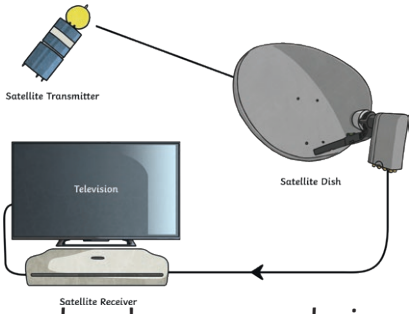
By monitoring the planet, satellites can also warn us of upcoming natural disasters. Because of this, people now have more time to prepare for potential hurricanes, volcanic eruptions or flooding.

Furthermore, satellites tell us a lot about climate change; they closely monitor any changes to the ocean and to **glaciers**.

In 2013, satellites unexpectedly detected approximately 66 trillion gallons of water beneath the ground in Kenya: a country which suffers from many droughts.

They Keep Us Connected

Satellite phones can be used to make phone calls from almost anywhere in the world. This means that they are vital in helping people to communicate when mobile phone networks are either overloaded or unavailable, such as in war zones or after natural disasters.



One global company is even planning to put several satellites into space to provide the first worldwide broadband service!

They Keep Us Entertained

Satellite dishes, which are a common feature of many modern homes, are designed to receive signals from satellites in space. These signals are then converted by a receiver box into programmes that can be watched on television.

They Help Us to Get Around

Satellite navigation systems (commonly known as 'satnavs') were first used in cars in 1996. Satellites play a crucial role in helping us to navigate to where we need to go without the need for printed maps. GPS (Global Positioning Systems) use information from satellites to help us to reach our destination. Many mobile phones now have mapping apps which use GPS.

They Improve Our Knowledge of Outer Space

Before space travel, scientists were limited to telescopes or the naked eye to explore the universe. The Hubble Space Telescope — a scientific satellite launched in 1990 — has discovered and photographed countless new galaxies and moons and has enabled humans to make many important scientific discoveries.

There are over 2,000 satellites orbiting the Earth (including many which are no longer being used). Satellites can now be launched at a much lower cost than ever before so this number is sure to continue to increase as people find new and exciting ways to use satellite technology.

Glossary

antenna: A metal rod or wire that sends or receives signals.

glaciers: Large areas of ocean ice that can float around the Earth's poles.

orbit: To repeatedly travel around a star, a planet or a moon.

Questions

1. Roughly how many satellites are currently orbiting Earth? Tick one.
   - ◯ over 25,000
   - ◯ over 17,000
   - ◯ over 20,000
   - ◯ over 2,000

2. Draw **four** lines and complete each sentence.

The Hubble Space Telescope...	was around the size of a large beach ball and was launched in 1957.
Online mapping tools...	use information from satellites to help people to navigate to a destination.
The satellite Sputnik 1...	was launched in 1990 and has enabled many important scientific discoveries.
GPS (Global Positioning Systems)...	use satellites to allow us to see most places in the world in 3D.

3. Find and copy a word or phrase which means that satellites are 'made by people'.

   _____

4. What piece of technology can help people to communicate when mobile phone networks are overloaded or unavailable?

   _____

5. Fill in the missing words.

   Weather _____ track weather patterns and this information is then used to create weather _____.

6. Look at the section called **What Is a Satellite?**
   Why do you think that this section been included in the text?

   _____

   _____

7. Look at the section called **They Help Keep Us Entertained.**
   In what way does the illustration help you to understand the text?

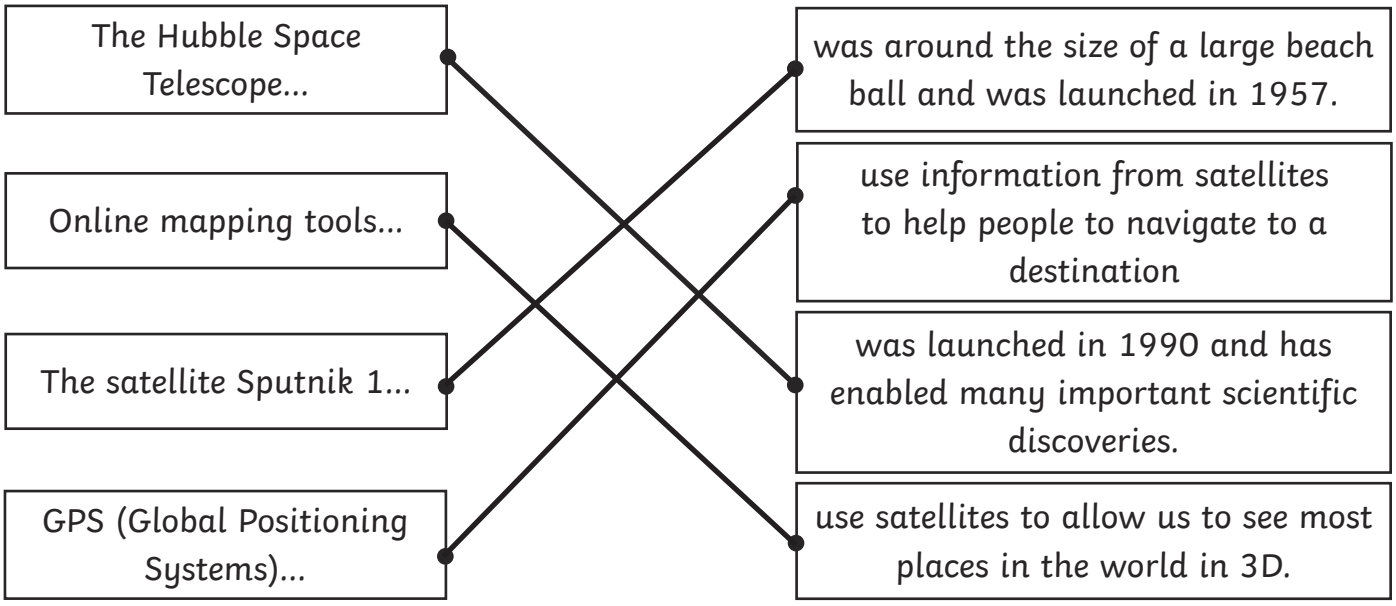
8. Predict what you think happened after satellites spotted water beneath the ground in drought-stricken Kenya.

9. Summarise what you have learnt about satellites in 25 words or fewer.

Answers

1. Roughly how many satellites are currently orbiting Earth? Tick one.
   - ○ over 25,000
   - ○ over 17,000
   - ○ over 20,000
   - ⊘ **over 2,000**

2. Draw **four** lines and complete each sentence.



3. Find and copy a word or phrase which means that satellites are 'made by people'.
   Accept either of the following: artificial; humanly-constructed.

4. What piece of technology can help people to communicate when mobile phone networks are overloaded or unavailable?
   Satellite phones are vital in helping people to communicate when mobile phone networks are either overloaded or unavailable.

5. Fill in the missing words.

   Weather **satellites** track weather patterns and this information is then used to create weather ***forecasts.***

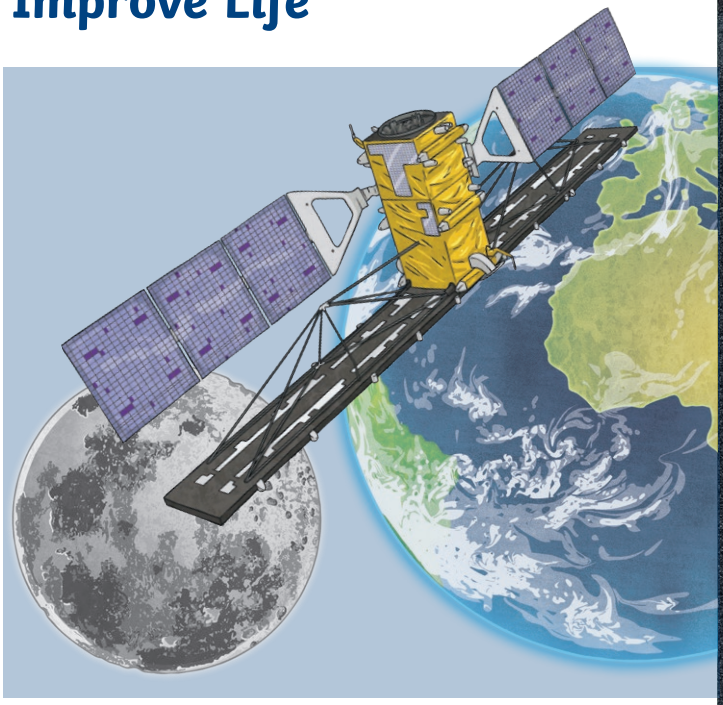
6. Look at the section called **What Is a Satellite?**
   Why do you think that this section been included in the text?
   Pupils' own responses, such as: This section has been included because it provides the reader with important background information about satellites which they need in order to understand why they improve our lives.

7. Look at the section called **They Help Keep Us Entertained**
   In what way does the illustration help you to understand the text?
   Pupils' own responses, such as: The diagram illustrates clearly to the reader where satellite television signals travel and what each part of the system looks like so it allows them to understand something that they might not have seen before.

8. Predict what you think happened after satellites spotted water beneath the ground in drought-stricken Kenya.
   Pupils' own responses, such as: After water was spotted underground, work probably began to find a way of reaching it so that it could be used as drinking water.

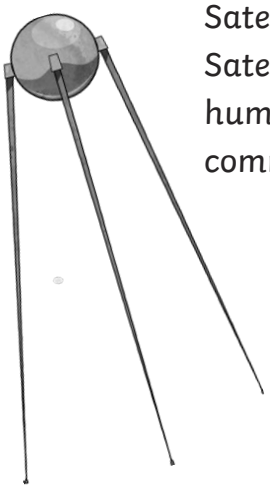
9. Summarise what you have learnt about satellites in 25 words or fewer.
   Pupils' own responses, such as: Satellites come in a variety of shapes and sizes. They orbit our planet and can gather information and transmit it back to Earth.

World Space Week 2020:
'Satellites Improve Life'



World Space Week is an annual celebration of space and technology which runs from the 4th October to the 10th October. The theme of the event for 2020 is 'Satellites Improve Life'. Satellites are used extensively by a wide range of organisations to fulfil a diverse range of tasks. They play a fundamental role in our modern lives and, whether we realise it or not, much of what we do in a day relies on satellite technology.

What Is a Satellite?



Satellites are objects that orbit planets and stars in space. Satellites can be natural, such as moons and rocks or they can be humanly-constructed (artificial). Artificial satellites can be used for communication or to gather useful information.

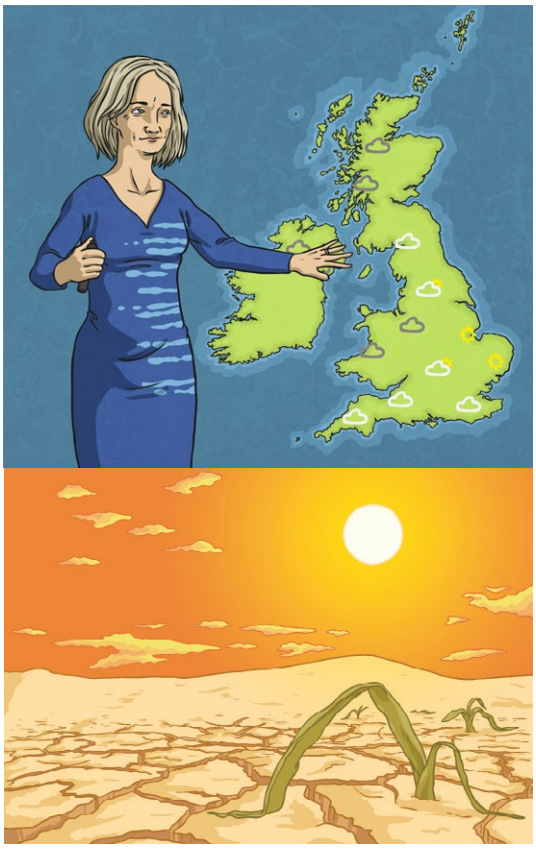
The first artificial satellite, Sputnik 1, was approximately the size of a large beach ball and was launched in 1957. Artificial satellites come in a variety of designs and scales but they can usually be identified by the two parts that they have in common: a power source and an antenna. Most artificial satellites are recognisable by their large solar panels. Many satellites generate power by using solar panels to convert sunlight into electricity. A satellite's antenna carries out the vital role of transmitting information to and from Earth.

Humanly-constructed satellites are launched into space using rockets and they maintain their orbit (which is usually between 100 to 1,250 miles from the Earth's surface) using a balance of gravity and speed. While in orbit, a satellite can travel at around 17,000 miles per hour.

Why Are Satellites Important?

Satellites transmit information back to Earth which can be used in countless different ways, many of which we may not even realise. For example, online mapping tools use satellites to allow us to see most places in the world in 3D.

They Monitor the Earth



Weather satellites scan our planet while circling the globe. Information from these satellites allows forecasters to predict weather patterns so that they can keep us informed about likely upcoming weather.

By monitoring the planet, satellites can also help to assess and predict natural disasters, such as potential volcanic eruptions, hurricanes and flooding. Before satellite technology, the impact of these disasters was much greater because they could not be easily tracked or predicted.

Furthermore, much of the information that we have about climate change comes from satellites: they can monitor the temperature of the oceans, detect rises in sea levels and track the size of glaciers.

In 2013, satellite imagery unexpectedly detected approximately 66 trillion gallons of water beneath the ground in drought-stricken Kenya, potentially saving many lives.

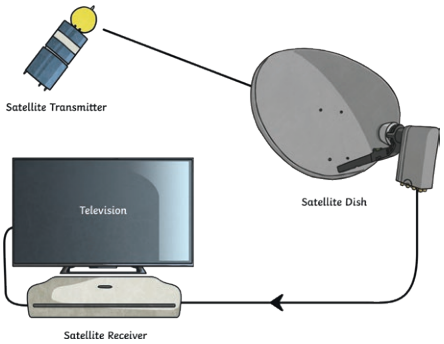
They Keep Us Connected

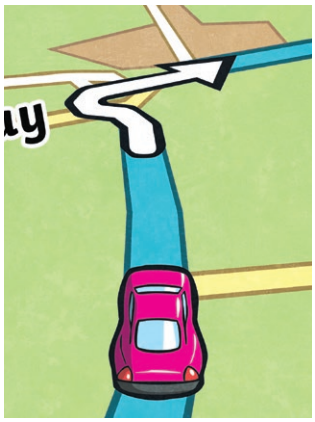
Satellite phones allow people to make phone calls from almost anywhere in the world. While mobile phones rely on land-based towers to transmit signals, satellite devices connect to orbiting satellites. These devices are invaluable in helping people to communicate while in war zones or during times of natural disaster, when mobile phone networks are either overloaded or unavailable.

One global company is even planning to create a constellation of satellites in order to provide a worldwide broadband internet service!

They Keep Us Entertained

The satellite dish is now a familiar feature on the roofs or walls of many modern homes. Satellite dishes are given this name because of their dish-shaped antenna that is designed to receive signals from satellites in space. These signals are then converted by a receiver into programmes that can be viewed on television.





They Help Us to Get Around

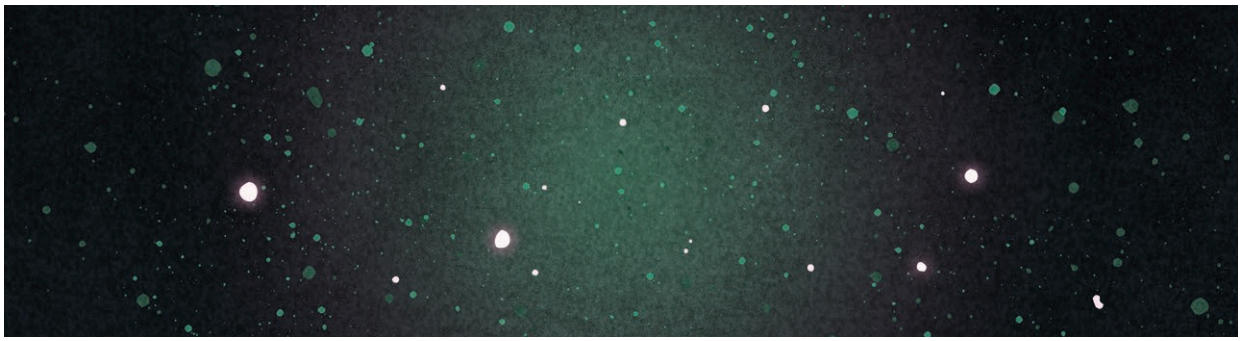
Satellites play a vital role in helping us to navigate to where we need to go. Cars, ships and aeroplanes fitted with GPS (Global Positioning Systems) use information from over 20 satellites positioned around the Earth to help us to reach our destinations. This system is commonly known as 'satnav' and was first used in cars in 1996. More recently, many mobile phones now have mapping apps which use GPS.

They Improve Our Knowledge of the World and Beyond

Before space travel was possible, astronomers and astrophysicists were limited to telescopes or the naked eye to explore the universe. The Hubble Space Telescope — a scientific satellite launched in 1990 — has enabled humans to make many important scientific discoveries. For instance, it has photographed new galaxies and moons, it has photographed stars being born and it has even helped us to date the universe at 13 to 14 billion years old.

What Is the Future of Satellite Technology?

There are more than 2,000 satellites orbiting the Earth (including many which are no longer in use). This number is sure to continue to grow as ever-advancing technology means that satellites, which are now available in miniature form and can be launched at a much lower cost than ever before, can be used in even more exciting and innovative ways.



Questions

1. Satellites need a balance of which of the following to stay in orbit? Tick **two**.
   - ◯ gravity
   - ◯ electricity
   - ◯ heat
   - ◯ speed

2. **Satellites are used extensively by a wide range of organisations to fulfil a diverse range of tasks.**
   Which of the following is closest in meaning to the word **diverse**? Tick one.
   - ◯ complicated
   - ◯ varied
   - ◯ difficult
   - ◯ similar

3. Find and copy one phrase which shows that satellite dishes are commonly seen outside of homes.

   _____

4. Name **two** situations in which satellite phones are particularly useful.

   • _____

   • _____

5. Why was the impact of natural disasters much greater before satellite technology?

   _____

   _____

6. Explain why you think the discovery of water under the ground in Kenya could have potentially saved many lives.

   _____

   _____

7. Look at the section called **They Help Keep Us Entertained.**
   Comment on how the use of an illustration aids the reader.

   _____

   _____

8. Look at the section called **They Help Us to Get Around**
   Compare how people would have navigated around before and after the invention of GPS.

9. Summarise what you have learnt about satellites in 20 words or fewer.

10. The theme of the event for 2020 is 'Satellites Improve Life'.
    Do you agree that satellites improve life?

    ☐ yes ☐ no

    Fully explain your choice.

Answers

1. Satellites need a balance of which of the following to stay in orbit? Tick **two**.
   - ☑ **gravity**
   - ○ electricity
   - ○ heat
   - ☑ **speed**

2. **Satellites are used extensively by a wide range of organisations to fulfil a diverse range of tasks.**
   Which of the following is closest in meaning to the word **diverse**? Tick one.
   - ○ complicated
   - ☑ **varied**
   - ○ difficult
   - ○ similar

3. Find and copy one phrase which shows that satellite dishes are commonly seen outside of homes.

   familiar feature

4. Name **two** situations in which satellite phones are particularly useful.

   Accept any two of the following: while people are in war zones; during times of natural disaster; when mobile phone networks are overloaded; when mobile phone networks are unavailable.

5. Why was the impact of natural disasters much greater before satellite technology?

   Before satellite technology, the impact of these disasters was much greater because they could not be easily tracked or predicted.

6. Explain why you think the discovery of water under the ground in Kenya could have potentially saved many lives.

   Pupils' own responses, such as: Kenya was a drought-stricken country so the water found beneath the ground could possibly be used as drinking water to save many lives.

7. Look at the section called **They Help Keep Us Entertained.**
   Comment on how the use of an illustration aids the reader.
   Pupils' own responses, such as: The diagram illustrates clearly to the reader where satellite television signals travel and what each part of the satellite television process looks like so they are better able to understand the text.

8. Look at the section called **They Help Us to Get Around.**
   Compare how people would have navigated around before and after the invention of GPS.
   Pupils' own responses, such as: Before the invention of GPS, people would probably have had to rely on printed maps and road signs to navigate to their destinations. Now, people can use satnav apps on their phones to navigate to almost any destination using various methods of transport.

9. Summarise what you have learnt about satellites in 20 words or fewer.
   Pupils' own responses, such as: Satellites come in a variety of shapes and sizes and orbit Earth to capture and transmit information for various purposes.

10. **The theme of the event for 2020 is 'Satellites Improve Life'.**
    Do you agree that satellites improve life?
    Fully explain your choice.
    Accept either 'yes' or 'no' provided that an explanation has been given, such as: Yes, I agree with this statement because many of us could not conduct our daily lives as easily without satellites; they help us to navigate to destinations, to stay connected with people around us and they can even help to save lives.