

1 Useful language

Vocabulary

Work in pairs. Match each word with the correct meaning.

- | | |
|---------------|--|
| 1. indeed | a) very large or heavy |
| 2. swirl | b) to give a reason, to help people understand |
| 3. massive | c) without stopping |
| 4. core | d) central part |
| 5. increase | e) to become more |
| 6. explain | f) to move quickly in circles |
| 7. explode | g) really, furthermore |
| 8. continuous | h) to burst with a lot of force |

2 The Milky Way

Reading, Listening, Grammar

Read and listen to the text. Complete the gaps with one word.

Under the Milky Way

People have always been interested in the night sky. They (1) _____ to think that the stars were gods: indeed, some of the planets have been named after Roman gods since Roman times. In the middle ages people believed that the Earth was at the centre of the universe and that the sun and the stars (2) _____ around us.

In 1543, Copernicus explained scientifically that it is the Earth that revolves, both on its own axis and around the sun. This was the beginning of the modern science of astronomy. But the stars still have a strong impact on human thought and culture, as we (3) _____ see from the survival of the much older beliefs of astrology.

Our solar system is located inside a galaxy called the Milky Way, which consists of many billions of stars. Everything in the Universe is constantly



figure 1: the Milky Way

(4) _____; even galaxies themselves are always in motion, swirling around the galactic centre.

The sky we look at is full of stars, the closest of (5) _____ (after the sun) is Proxima Centauri (which is 40 million million km away). The reason we can see the stars from so far away is because they have very hot surfaces, like the sun.

The colour of the stars helps us to understand what they are made of: the hottest stars are blue and the coolest are orange and white. Stars have a life just like human beings: they are born, get older and (6) _____ die. When stars die they often just cool down to a small cold ball in the sky, but sometimes they explode and for a short time become very very bright: these stars are (7) _____ as supernovas.

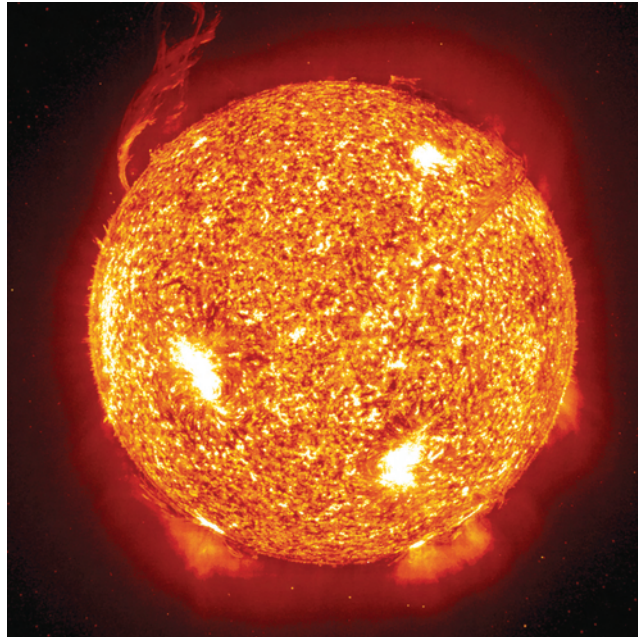


figure 2: the sun

3 The sun

Reading

Read the text, then cover it and try to remember what the numbers represent.

The sun is just one of more than 100 billion stars in the Milky Way galaxy, which is one of at least 20 million galaxies in the universe. It is the centre of our solar system and is a medium-sized star (which means it is about 300,000 times more massive than Earth and has about 1,300,000 times the Earth's volume). The temperature on the surface of the Sun is 5,500 °C. Deeper inside the sun it is even hotter and denser. It is the light and heat from the sun which make life on Earth possible.

Why is the sun so hot? The sun consists mostly of the two lightest types of atom: hydrogen and helium. In the core of the sun continuous nuclear reactions occur, fusing two atoms of hydrogen together to make helium. This reaction produces the energy that makes the sun so hot – it is the same reaction that is used in hydrogen bombs. Once all the hydrogen has been transformed into helium the sun will die. But there's no need to worry about this, as it is estimated that this will happen about 5 billion years from now!

- a) 2
- b) Five thousand five hundred
- c) Three hundred thousand
- d) One million three hundred thousand
- e) 20,000,000
- f) 5,000,000,000
- g) 100,000,000,000

Work in pairs. Use the Useful Language box to describe each of the eight phases of the moon in the diagram.

The Earth has only one natural satellite – the moon – although some other planets have many. The moon is visible from Earth because it reflects the light of the sun. The moon has phases: when we can see the sun shining across the near side of the moon, when the moon is opposite the sun, we call it a *full moon*. When the moon is between the Earth and the sun it appears dark because we cannot see the sunlight reflected off its surface, and it is called a *new moon*. The moon changes as it orbits the Earth: if the size of the bright part increases it is said to *wax*; if it decreases it *wanes*.

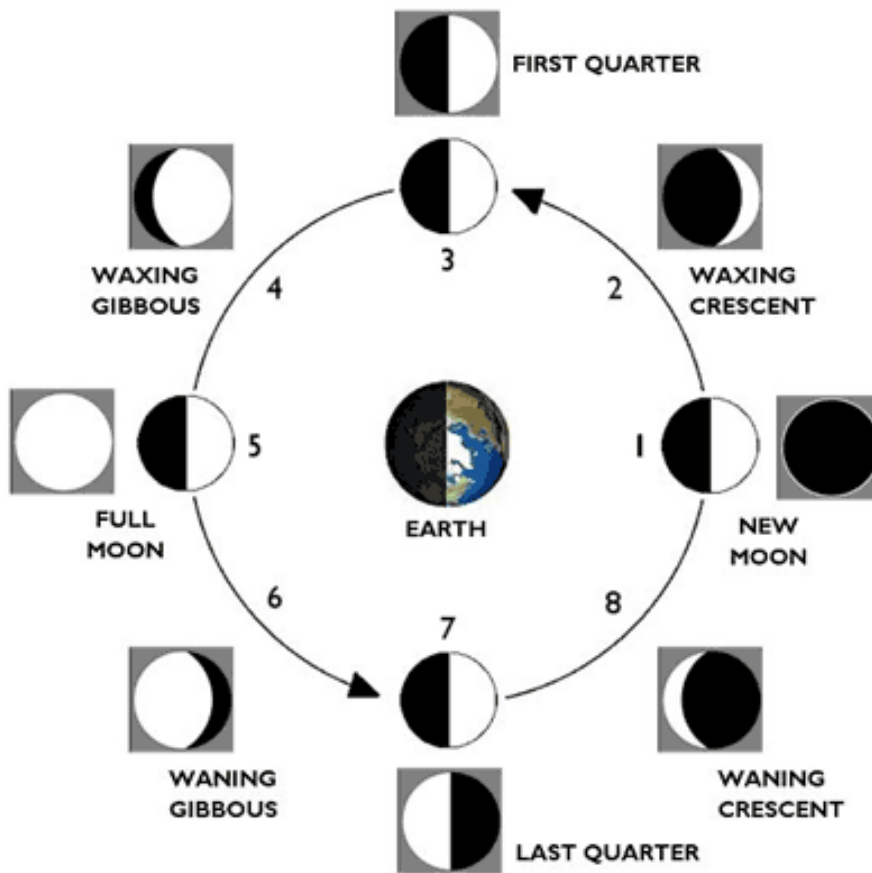


figure 3: the moon

Useful Language

In the ... phase ...	the moon is ...
between / opposite / alongside	... the Earth/Sun
the side of the moon facing the sun	not visible / partly visible / completely visible
more/less of it is visible each day	

This worksheet is designed for a single lesson, and will take 45–90 minutes to complete. It is suitable for lower secondary school students who are learning about the universe and the solar system for the first time.

Useful language

Vocabulary

Aims

- To introduce some vocabulary used in the texts

Students can try this alone at first, and then check in pairs.

Key

1 g; 2 f; 3 a; 4 d; 5 e; 6 b; 7 h; 8 c

2 The Milky Way

Reading, Listening, Grammar

Aims

- To learn about stars and galaxies
- To practise and test some basic grammar knowledge, especially verb forms

Students read and listen at the same time. They fill in the gaps individually with the words they hear, and then check their answers in pairs. If need be, read the script a second time before a full class feedback session.

Key

1 used; 2 moved; 3 can; 4 moving; 5 which; 6 eventually; 7 known

Script**Under the Milky Way**

People have always been interested in the night sky. They used to think that the stars were gods: indeed, some of the planets have been named after Roman gods since Roman times. In the middle ages people believed that the

Earth was at the centre of the universe and that the sun and the stars moved around us.

In 1543, Copernicus explained scientifically that it is the Earth that revolves, both on its own axis and around the sun. This was the beginning of the modern science of astronomy. But the stars still have a strong impact on human thought and culture, as we can see from the survival of the much older beliefs of astrology.

Our solar system is located inside a galaxy called the Milky Way, which consists of many billions of stars. Everything in the Universe is constantly moving; even galaxies themselves are always in motion, swirling around the galactic centre.

The sky we look at is full of stars, the closest of which (after the sun) is Proxima Centauri (which is 40 million million km away). The reason we can see the stars from so far away is because they have very hot surfaces, like the sun.

The colour of the stars helps us understand what they are made of: the hottest stars are blue and the coolest are orange and white. Stars have a life just like human beings: they are born, get older and eventually die. When stars die they often just cool down to a small cold ball in the sky, but sometimes they explode and for a short time become very very bright: these stars are known as supernovas.

3 The sun

Reading

Aims

- To learn about the sun
- To practise numbers
- To test understanding and retention of detail from a reading passage

Give the students a time limit to read the text. Three minutes should be sufficient. Then, ask them to get into pairs and make them cover the text and look at the questions. Once all the pairs have finished matching the numbers with the descriptions, hold a feedback session with the whole class to negotiate agreement about the matching (don't tell them the answers) before allowing them to look back at the text to check if they were right.

Key

a 4; b 5; c 7; d 2; e 3; f 1; g 6

Aims

- To learn about the phases of the moon
- To describe a diagram orally

Students continue to work in pairs. After one reading of the text, they should concentrate on the diagram. Tell them which picture to start from, and get them to work round the diagram in an anticlockwise direction, taking turns to describe each phase using the Useful Language box.

This worksheet is designed for a single lesson, and will take 45–90 minutes to complete. It is suitable for lower secondary school students who are learning about the universe and the solar system for the first time.

Useful language

Vocabulary

Aims

- To introduce some vocabulary used in the texts

Students can try this alone at first, and then check in pairs.

Key

1 g; 2 f; 3 a; 4 d; 5 e; 6 b; 7 h; 8 c

2 The Milky Way

Reading, Listening, Grammar

Aims

- To learn about stars and galaxies
- To practise and test some basic grammar knowledge, especially verb forms

Students read and listen at the same time. They fill in the gaps individually with the words they hear, and then check their answers in pairs. If need be, read the script a second time before a full class feedback session.

Key

1 used; 2 moved; 3 can; 4 moving; 5 which; 6 eventually; 7 known

Script**Under the Milky Way**

People have always been interested in the night sky. They used to think that the stars were gods: indeed, some of the planets have been named after Roman gods since Roman times. In the middle ages people believed that the

Earth was at the centre of the universe and that the sun and the stars moved around us.

In 1543, Copernicus explained scientifically that it is the Earth that revolves, both on its own axis and around the sun. This was the beginning of the modern science of astronomy. But the stars still have a strong impact on human thought and culture, as we can see from the survival of the much older beliefs of astrology.

Our solar system is located inside a galaxy called the Milky Way, which consists of many billions of stars. Everything in the Universe is constantly moving; even galaxies themselves are always in motion, swirling around the galactic centre.

The sky we look at is full of stars, the closest of which (after the sun) is Proxima Centauri (which is 40 million million km away). The reason we can see the stars from so far away is because they have very hot surfaces, like the sun.

The colour of the stars helps us understand what they are made of: the hottest stars are blue and the coolest are orange and white. Stars have a life just like human beings: they are born, get older and eventually die. When stars die they often just cool down to a small cold ball in the sky, but sometimes they explode and for a short time become very very bright: these stars are known as supernovas.

3 The sun

Reading

Aims

- To learn about the sun
- To practise numbers
- To test understanding and retention of detail from a reading passage

Give the students a time limit to read the text. Three minutes should be sufficient. Then, ask them to get into pairs and make them cover the text and look at the questions. Once all the pairs have finished matching the numbers with the descriptions, hold a feedback session with the whole class to negotiate agreement about the matching (don't tell them the answers) before allowing them to look back at the text to check if they were right.

Key

a 4; b 5; c 7; d 2; e 3; f 1; g 6

Aims

- To learn about the phases of the moon
- To describe a diagram orally

Students continue to work in pairs. After one reading of the text, they should concentrate on the diagram. Tell them which picture to start from, and get them to work round the diagram in an anticlockwise direction, taking turns to describe each phase using the Useful Language box.