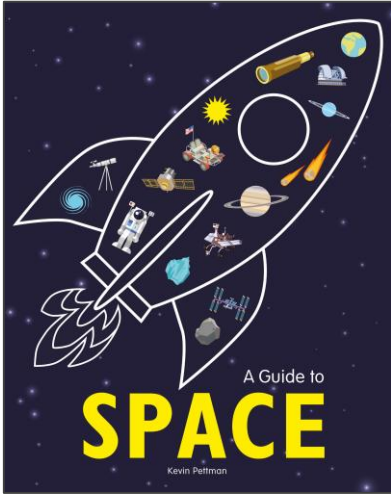


# The Big Topic: Space



## *A Guide to Space*

Welcome to the infographic guide to the most exciting place outside Earth: **SPACE!**

Discover mind-boggling facts, figures and amazing explorations in eye-popping infographics. Great for visual learners in KS2.

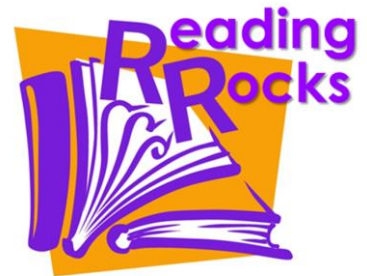
9781526307378    £12.99

### Cross-Curricular Lesson Ideas

This is a bright and engaging, fact-filled book that is perfect to share in a KS2 classroom to get your pupils excited about space travel. These resources are written with the KS2 National Curriculum for Year 5 and Year 6 in mind.

- Space Words
- Terrific Temperatures
- Space Quiz
- Planet Wars

Resources created by:



# The Big Topic: Space

## Space Words

Vocabulary is *so* incredibly important. Developing pupils' vocabulary will improve their future success. This double page spread, giving high value to words, is an excellent page to keep coming back to.

**Understanding space words**  
Space may seem complex and mind boggling, but if you can understand these key words and phrases it will help you get a clearer picture of what's going on above Earth.

**Space**  
Space starts at about 100 kilometres above Earth. It has no breathable air. It looks black because there aren't enough oxygen molecules to make it look blue.

**Universe**  
Everything that exists, including stars, planets, moons, and everything that will develop in the future, or part of the universe.

**Big Bang**  
The Big Bang is what most experts think was the start of the universe. About 13.8 billion years ago, something incredibly tiny exploded and expanded rapidly to begin forming the universe. After about 4.6 billion years the Sun was formed, followed by the planets.

**Star**  
A star is a big ball of gas with tremendous light and heat. Stars are formed when clouds of gas and dust collapse and break up.

**Solar system**  
The solar system is made up of a star and the objects that travel around it. These objects can be planets, moons, asteroids, comets, and dwarf planets. The centre of our solar system is the sun.

**Planet**  
A planet is an object that orbits around the Sun, has a nearly round shape and has a clear path in which it moves around the Sun. Dwarf planets, like Pluto, are different because they usually have other objects crossing their path.

**Atom**  
An atom is the smallest particle of a chemical element. Atoms join together to form molecules. Atoms are made up of protons, electrons and neutrons.

**Galaxy**  
Our solar system is part of the Milky Way galaxy. A galaxy is a massive collection of stars and billions of stars.

**Orbit**  
An orbit is a regular and repeated path that an object takes around another in space.

**Atmosphere**  
The atmosphere is made up of the gases surrounding a planet, start on Earth, or well as other objects like stars and some moons.

**Astronomer**  
An astronomer is a scientist who studies objects in the sky. Famous astronomers of the past include Nicolaus Copernicus, Johannes Kepler, Galileo Galilei, Sir Isaac Newton and Claudius Ptolemy.

**Speed of light**  
Light travels at a speed of 299,792,458 metres per second.

**Satellite**  
An object in an orbit is a satellite. This can be a natural object, such as a moon, or a human-made object like the International Space Station or a space telescope.

**Light year**  
A light year is the distance light can travel in one year (365 days). It is equal to about 9.5 trillion kilometres.

**Mass**  
The mass of an object is a measure of how much stuff it is made of. It is not the same as weight, which is a force acting on that stuff.

**Matter**  
Matter is anything that has mass and takes up space. It can be solid, liquid, gas or plasma. Planets, stars and moons are made of matter.

**Astronomical unit (AU)**  
One astronomical unit (AU) is equal to 149,597,870,700 metres. It is the average distance between Earth and the Sun and is a useful measuring distance in space science.

**Astronaut**  
A person who travels in a spacecraft into space.

**NASA**  
The National Aeronautics and Space Administration is an American government agency that looks after the country's space program, research, and research.

- Pair up pupils to challenge each other. One partner reads the definition, the other says the word. Try it the other way, where the partner gives the word and the other gives a definition. A few minutes on this each day and pupils will be space word experts in no time!
- As you learn about space travel, and read through the book, let pupils create their own space word collection. They can recreate the graphic style of this page.



# The Big Topic: Space

## Terrific Temperatures

Temperatures appear on most pages in the book. Get pupils to scan for specific information for this task. Point out that temperatures are recorded in degrees Celsius, so this is a great clue to search the page for (°C).

**A meeting with Mercury**

Small and speedy is a good description of the rocky planet Mercury. From extreme temperatures to huge craters and maybe even some ice caps, there's lots going on under its very thin atmosphere.

Mercury is the closest planet to the Sun, between 47 million and 70 million kilometres away.

Mercury is 4,879 kilometres wide. It has been half the width of Earth. Mercury is the smallest planet in our solar system - only 1/10th the size of Earth!

Mercury needs 88 Earth days to orbit the Sun. It takes 176 Earth days to complete one orbit.

Mercury is the darkest planet because it reflects only 11 per cent of the sunlight that hits it.

Experts also think Mercury is dark because carbon compounds in its outer coat give it a very dark appearance.

There's a temperature range on Mercury - warmer than an oven when it's hot. During the day it can rise to 430°C, but it can drop to an icy -180°C at night.

At times the Sun appears 3 times bigger when seen from Mercury than it does from Earth.

50% of whatever weight we see on Earth has weight only 1/10th as much on Mercury.

The planet's gravity is 1/3rd that of Earth's.

It takes just 88 days for Mercury to orbit the Sun and 176 the planet to spin around once.

That's over 450 times faster than a normal 24-hour day.

Fast-moving asteroids are called meteoroids. Some are as big as a house and can burn up in the atmosphere.

Fast-moving asteroids are called meteoroids. Some are as big as a house and can burn up in the atmosphere.

Mercury has been divided into 6 regions, which include volcanic, crater, and ice-covered. There are also other various periods.

Tobacco Series (Gusztav Horthy, Leo Tolstoy)

Beethoven Region (Germans composer Ludwig van Beethoven)

Chaliquere Region (English poet and playwright William Shakespeare)

Mercury is so shiny that NASA's Messenger spacecraft had to spend a lot of time avoiding the planet from orbit.

Launched in 2003, the MESSENGER spacecraft mapped every square centimetre of Mercury's surface.

Because it is so close to the Sun and orbits very quickly, Mercury can be seen from Earth only during a small window of time each year.

The name of the planet has two meanings.

Mercury has been divided into 6 regions, which include volcanic, crater, and ice-covered. There are also other various periods.

Temperature graph: 610°C, 375°C, 430°C.

**figures**

Nearly 150 million kilometres and heat, life would not exist important facts about the

The diameter of the Sun is 1,392,884 km.

The Sun is 330,000 times heavier than Earth.

The Sun is a giant ball of glowing gas.

91 per cent of its atoms are hydrogen and 8.9 per cent are helium.

Only 0.1% of its atoms are oxygen, carbon, nitrogen and iron.

Every 11 years the Sun's layers go through changes and can become violent, causing space weather and changes to human activities such as satellites and power grids.

Scientists think the Sun will burn for between 10 to 11 billion years, which means it has around 8 billion years left to live.

It burns through 600,000,000 kg of fuel per second.

It never looks directly at the Sun, even through sunglasses or a telescope. It can seriously damage your eyes.

**WARNING!**

When the Sun begins to die, it will probably expand and engulf Mercury, Venus and Earth before collapsing in on itself.

**6 regions, or layers, make up the Sun ...**

Core: It's where nuclear reactions between hydrogen atoms create more helium.

Convective zone: Carries energy to the surface, which takes 100,000 years to reach the surface.

Chromosphere: Is the 3rd layer of atmosphere next to the Sun.

10% The Sun's luminosity (brightness) increases by 10 per cent every 11 years.

Photosphere: Is the 2nd layer of atmosphere, where most gas has not reached the surface.

Corona: Is the outer atmosphere, where sunlight and solar wind are released.

2 The minimum number of solar eclipses which can be seen from Earth each year, and which those can be partial eclipses, is only visible from within the Moon's shadow in front of the Sun and covers it from view.

Black holes are thought to exist during the super-nova stage of a star.

RIP SUN, RIP MERCURY, RIP VENUS, RIP EARTH.

- It is good skill to be able to retrieve information from one form of text and to organise in another way. Use the table on the next page for pupils to record their findings. Discuss with them that they may not be able to fill in each box.
- Now try creating a graph with this data. Discuss which type of graph would best show the information found.
- Discuss what the graph shows very clearly. Encourage pupils to come up with a generalisation in paired discussions. Talk starters should help structure responses:

*We have noticed that...*

*We spotted a pattern that...*

*The closer the planet to the sun.....*

*The further away the planet from the sun.....*



# The Big Topic: Space

## Terrific Temperatures

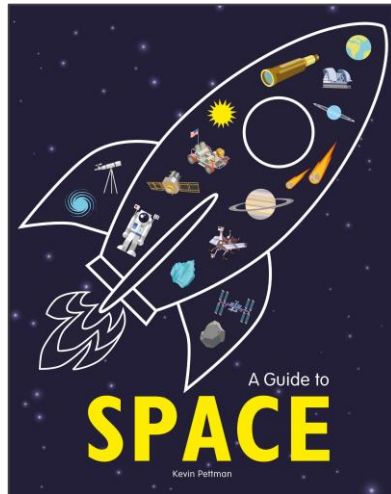
<b>Name of planet:</b>	<b>Highest temperature</b> <b>(°C)</b>	<b>Lowest temperature</b> <b>(°C)</b>	<b>Average temperature</b> <b>(°C)</b>



# The Big Topic: Space

## Space Quiz

Each page of this book is jam-packed with facts for pupils to devour. Giving pupils a purpose and outcome to their reading can improve engagement and motivation.



- Set up pupils into small teams. Each team will create a round in The BIG Space Quiz, for the rest of their classmates to compete in. Give each team a planet to pose their questions on.
- The next page will guide groups to read all the information and help them to create a variety of questions. Each question should have 1 correct response and 3 incorrect responses, making the quiz multiple choice.
- When it comes to playing the quiz, let each team create a name for themselves (this could link to their planet). The team should also select a question reader. Encourage the reader to use a clear voice, so the teams have a fair chance of answering. When they read the four options for answers, the need to be really careful not to reveal which is the correct answer. Discuss a clear neutral voice here.



# The Big Topic: Space

## The BIG Space Quiz

### The..... Round

Planet name goes here

Created by..... Team

<b>1</b>	<i>A question about temperature:</i>  <b>A</b> ..... <input type="checkbox"/> <b>B</b> ..... <input type="checkbox"/> <b>C</b> ..... <input type="checkbox"/> <b>D</b> ..... <input type="checkbox"/>
<b>2</b>	<i>A question about distance to the Sun:</i>  <b>A</b> ..... <input type="checkbox"/> <b>B</b> ..... <input type="checkbox"/> <b>C</b> ..... <input type="checkbox"/> <b>D</b> ..... <input type="checkbox"/>
<b>3</b>	<i>A question about size:</i>  <b>A</b> ..... <input type="checkbox"/> <b>B</b> ..... <input type="checkbox"/> <b>C</b> ..... <input type="checkbox"/> <b>D</b> ..... <input type="checkbox"/>
<b>4</b>	<i>A question about interesting features:</i>  <b>A</b> ..... <input type="checkbox"/> <b>B</b> ..... <input type="checkbox"/> <b>C</b> ..... <input type="checkbox"/> <b>D</b> ..... <input type="checkbox"/>
<b>5</b>	<i>A question about ..... ?</i>  <b>A</b> ..... <input type="checkbox"/> <b>B</b> ..... <input type="checkbox"/> <b>C</b> ..... <input type="checkbox"/> <b>D</b> ..... <input type="checkbox"/>



# The Big Topic: Space

## Planet Wars

Allow pupils to select a favourite planet to research and talk about.

- Set up pupils against each other e.g. Mars versus Jupiter.
- Pupils should gather as many interesting facts and features of their planet to champion it as the best planet. Encourage them to include facts about size, temperature, distinguishing features, orbits, moons and distance to the sun.
- They should then structure this into a speech for the planet battle. Offer different sentence structures to help them:

..... is the best planet because .....

..... is ....., and ....., therefore is the ultimate planet.

Allow me to introduce you to the most..... planet there is!

It's clear ..... is a truly ..... planet due to the fact it.....

- Discuss the use of persuasive devices to win over the audience. Be clear here that the purpose of the speech is to convince the audience that their planet is THE best. The aim is to win!
- Give pupils time to practise their speech. They may wish to annotate their writing to show where they will pause for effect, emphasise words or phrases, and actions or looks they may make to the audience.
- Set up the stage for the battle at the front of the classroom or in the hall to build some excitement. Time the pupils on their speeches (maybe 1-2mins each). After each pair is complete, allow the audience to vote on the winning planet.

