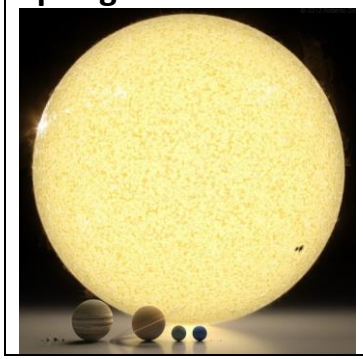
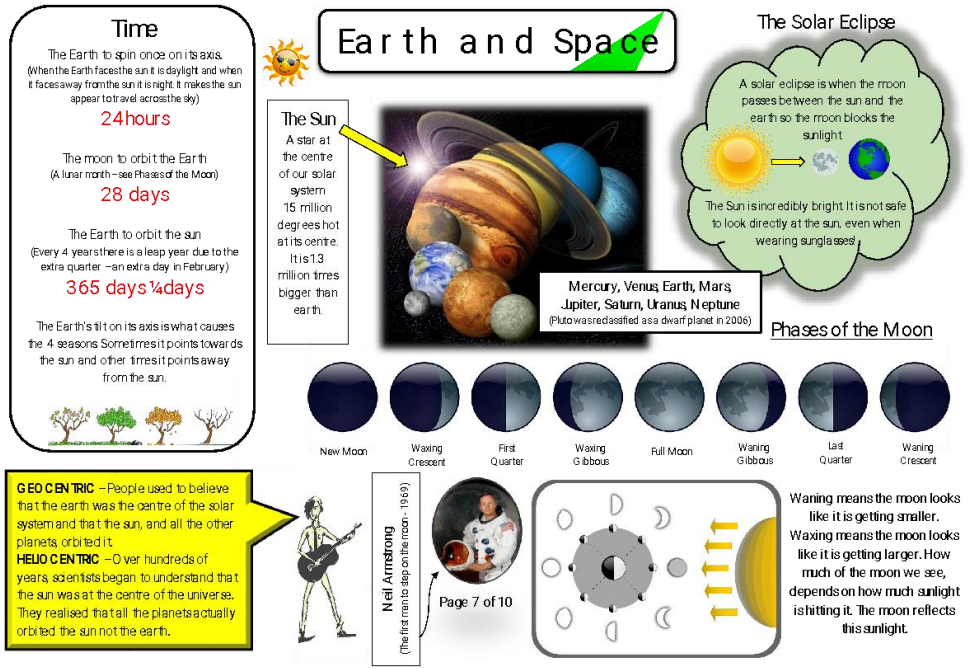
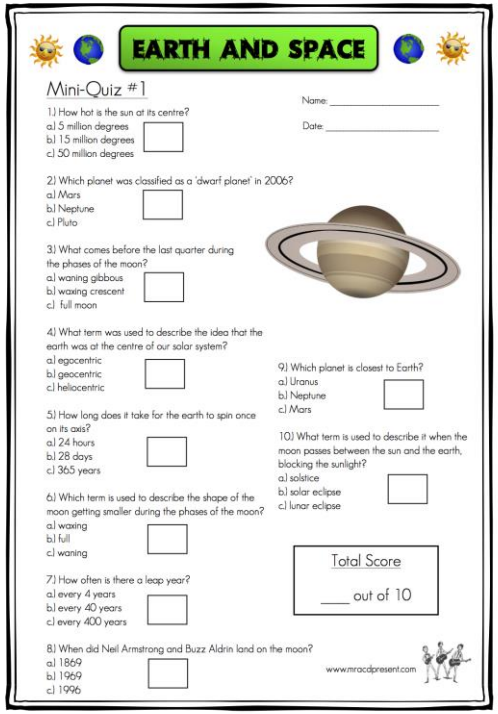
UNDERSTANDING OUR WORLD AND BEYOND EXPEDITION: Earth and Space **Spring 1** 	OVERVIEW: **The Cosmos; The Universe; Outer Space…places that are at the far reaches of our imaginations (and often the limitations of our scientific understanding). This topic will inspire awe and wonder by exploring previously unimaginable distances and reaching back through vast amounts of time to discover and study our planet, the moon, the solar system and worlds beyond our own.** **Drawing on non-fiction texts, footage from missions into space and fictional stories that are filled with scientific fact, the mysteries of Space will be filled with knowledge. The pupils will endeavour to become cosmologists: experts who will have understood lengths of time, studied elements of our physical universe and delved deeper into the lives of those involved with the exploration of stars.**	<u>Cultural capital</u> **What you do:** Virtual tours of the Science Museum, Virtual Day on Mars during science week, listening to music such as Holst's 'The Planets' and David Bowie 'Space Oddity' **How you think:** Models, images and film to demonstrate the effects of the Sun, the moon and to gain an idea of distances and time. **What you know:** knowledge of key dates in space exploration, vocabulary links such as 'satellite' **Who you know:** knowledge of key people both in the forefront and in the background of space exploration. Biographies of Katherine Johnson and Tim Peake.

Knowledge Organisers and Assessment:





SUPPORTING TEXTS: From our Reading Roadmap

Cosmic by Frank Cottrell Boyce

Children will be guided to read or will have read to them: *A Galaxy of Her Own- Amazing Stories of Women in Space* Libby Jackson, *Curiosity – The Story of a Mars Rover* Markus Motum, *The Big Beyond* James Carter, *Hidden Figures- The Story of Four Back Women and the Space Race* Margot Lee Shetterly and *The Skies Above My Eyes* Yuval Zoomer. *George's Secret Key to the Universe* by Stephen Hawking	

Vocabulary:

Earth, planets, Sun, solar system, Moon, celestial body, sphere /spherical, rotate /rotation, spin, night & day, orbit, opinion /fact, support /refute, Mercury, Venus, Mars, Jupiter, Saturn, Uranus, Neptune, Pluto, 'dwarf' planet, accuracy, precision, scatter graphs, line graphs, geocentric & heliocentric models, star, rotate /rotation, spin, axis, night and day, shadow clocks, sundials, astronomical clocks, telescope, satellite, tide, mass, gravity, eclipse, universe, constellation, axis, celestial body, Moon, rotating, lunar, solar, telescope.

Skills and Key Questions: Covered during this expedition

Research, Note taking, Ask questions, Plan to answer a question, Create fair tests, Make predictions/hypothesis , Select equipment, Observe over time, Measure, Record /present data, Notice patterns, Make conjectures, Make comparisons, Make links, Generalise

Key Science Knowledge: Pupils will use their own research, non-fiction texts, models and videos to explore each of the areas outlined below. They will, through scientific enquiry, be able to answer: The Earth: Why did people think the Earth was flat? What does the Earth look like from Space? How do Scientists believe the Earth was formed?	The Earth ● Name at least two other shapes the Earth was thought to be. ● I can identify scientific evidence that has been used to support or refute ideas. ● Plan a shadow investigation ● Observing, measure, record and identify patterns for changing shadows throughout a day ● Present scientific evidence in the form of a working 'shadow clock' model ● Track the Earth's movement by making and observing a sundial ● Explore the Earth's movement through simulation and time zones ● Explain using evidence how night and day occur. The Moon ● Solve problems using scientific evidence ● Carry out a simulation to investigate and demonstrate why the moon appears as it does in the sky

Is there evidence that the Earth spins? Why are there different times of day and night around the world? The Moon: What is a Moon? How does the Moon effect us? Have we visited the Moon? The Solar System: What is the Solar System? What are the Names Of The Planets? What are the differences between the planets? Why Are Some Called Planets and others are not? Why are planets spherical? The Sun: How does the Sun effect us? What is Geocentric and Heliocentric? What is a solar eclipse? Are there other Suns? The Worlds Beyond:	● Use photos as a scientific source to identify features on the moon ● Link lunar phases to the position of the Moon, Earth and Sun in the form of a diagram ● Understand how the moon creates tides. The Solar System ● Create a scaled solar system model/diagram using spherical representations. ● Research and collate planetary data online and represent it graphically. ● Explain how the planets orbit the Sun. ● I can explain theories of planetary movement in the solar system using evidence. ● I can identify scientific evidence with support. I can identify scientific evidence. ● I can identify scientific evidence that has been used to support or refute ideas. The Sun ● Understand the difference between geo and heliocentric solar system and how views have evolved ● I can explain how the planets orbit the Sun. ● I can distinguish between heliocentric and geocentric ideas of planetary movement. ● I know how a solar eclipse happens and can create a way to demonstrate this. ● I know the our star is called The Sun ● I know that there are much larger stars. ● I know that stars have a limited ‘life span’. The Worlds Beyond Our Own ● I know that stars are made of particles that gradually pull together. ● I know that the pressure at their centre causes a nuclear reaction. ● I know that when they explode they send matter further out into the space around them. ● This matter goes on to form new stars, planets or moons. ● As their mass increases their gravity increases. ● Gravity is a force that pulls other objects towards its centre.

Where are stars 'born'? What is a black hole? How can we see the stars? What is gravity? The Explorers: Who has been to the moon? How far have we travelled into space? How far can we see into space?	The Explorers ● Know that Neil Armstrong was the first man on the moon. ● Know that he was accompanied by Buzz Aldrin ● Know that the mission was Apollo 11. ● Know that Tim Peake was the first British astronaut to live on the ISS ● Know that Valentina Tereshkova was the first woman in space.