

How to Plan and Run Your Own Space Week



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You can find this booklet online at www.stem.org.uk/rxfpj4

Introduction

A Space Week is a fantastic addition to any primary school's calendar. It can be a great way to promote science across the school as the subject of space links to so many aspects of the primary science curriculum for all year groups. Space is also a vibrant context for cross-curricular learning which really captures children's imaginations.

This guide aims to support primary schools in planning and running their own Space Week. It will provide you with a wealth of ideas for activities for children in EYFS and primary schools as well as links to many high-quality resources to support teachers in planning a week of engaging learning experiences for their pupils. The guide describes everything you need to do to have a fantastic space-themed week in your school and also gives tips for the next steps to really develop space education across your school.

This resource is brought to you from the European Space Education Resource Office for the UK (ESERO-UK), which is an education project from the European Space Agency (ESA). We hope that you find this resource useful and we would love to hear all about your school's Space Week so please share your experiences with us via Twitter using @ESERO_UK

Countdown to Space Week

> Before your Space Week

What to do	Notes
Sell the idea to the school Leadership Team	Ensure that the Leadership Team are clear on the aim and objectives of your Space Week and the benefits it will bring – even better if it can be included on the School Development Plan. Discuss whether you can have a budget for the event to cover new resources, prizes for competitions and refreshments for events.
Set the date	It could be any week that works for your school, however, World Space Week from the 4 to 10 October would be ideal, or maybe even British Science Week in March. It is worth bearing in mind that if you want to include stargazing activities the winter months would be better.
Develop an action plan for the Space Education Quality Mark (SEQM)	Running a Space Week and getting everyone involved will definitely help you make huge progress towards the Bronze SEQM Award. Get registered and identify the kind of evidence you will have to collect along the way. www.stem.org.uk/esero/space-education-quality-mark
Get a plan	Plan an overview for the week – decide on your big events and map out a week of activities for classes across the school.
Staff meeting	Ensure that your teaching team understand the aims and objectives and direct them to resources to help them plan their week in their classroom. Ask teams of teachers to help with the organisation of some of your bigger events.
Book field trips	If any of your classes will be going on space-themed field trips book coaches and tickets early. Send letters asking for donations from parents.
Book STEM Ambassadors and visitors	Contact STEM Ambassadors, local universities, local aerospace companies and amateur astronomy groups to enlist their support. Don't forget to check if any parents or carers work in this area or are astronomy enthusiasts. www.stem.org.uk/stem-ambassadors
Launch your space science fair	Give the children at least a month's notice to develop their own space-themed science fair project if you are going to include a science fair in your activities. Have a launch assembly and send information home to parents and carers.
Teachers plan their sessions	Do this as early as possible so that the required resources are identified and made available in Space Week.
Publicise Space Week	Promote your event around the school community to build excitement and make sure that everyone knows how they can get involved: posters, newsletters and social media. Contact local press about any special events you are holding and invite them along. Remember to get photographic consent for sharing images through the press or forms of social media.

Countdown to Space Week

> During Space Week

What to do	Notes
Use space as a theme throughout the week to excite your pupils about learning	Children will be inspired, excited about their learning, and full of awe and wonder as they develop their understanding of the universe and the amazing feats of the aerospace industry.
Run an enrichment programme	Make the most out of the week by providing opportunities for children and families to learn beyond the school day. Enlist the support of as many members of the school staff as possible: lunchtime supervisors, sports coaches, admin support and caretaking staff.
Document what you do	Collect lots of photos and quotes from children, teachers and parents as the week progresses. Great to share on social media to inspire other schools and great evidence for your SEQM submission.

> After Space Week

What to do	Notes
Share what you did	Support children in creating a Space Week newsletter to go home to parents and carers, celebrating the success of the event.
Complete your application for SEQM	Submit your reflection and evidence for the SEQM award to get the recognition for all of your hard work.



Suggested Week Overview

So, what might a Space Week in your school look like? Below are some sample plans for a whole-school Space Week. In the first example a common activity is identified for each morning and afternoon session, then the class teachers plan the details of this activity, appropriate for the group of children they are working with. In this format, the space theme is very open which gives lots of choice as to what activities they will choose to organise for their classes. This example also includes many opportunities for pupil-led events, for example a pupil-led assembly and celebration assembly, children leading astronaut training in the playground at lunchtime and pupils presenting their personal space projects in a whole-school space science fair.

This is a great approach if you are new to organising such an event. Use the sections later in this guide to find suggestions of activities you could run in each of the sessions.

Sample Plan 1 – A General Space Week

		Monday	Tuesday	Wednesday	Thursday	Friday
Assemblies		Launch Assembly	Space Music Assembly	Space STEM Assembly	Pupil-Led Assembly	Celebration Assembly
Morning Session	EYFS	SPACE-THEMED CONTINUOUS PROVISION				
	Y1	Space Creative Writing (stories, poetry, drama)	Space Maths Challenge	Space Science Workshop 2	Space Creative Writing (stories, poetry, drama)	Space Maths Challenge
	Y2					
	Y3					
	Y4					
	Y5					
	Y6					
Lunchtime Activities		Mission X Astronaut Training				
Afternoon Session	EYFS	SPACE-THEMED CONTINUOUS PROVISION				
	Y1	Space Science Workshop 1	Space Creative Writing (stories, poetry, drama)	Whole-School Space Science Fair	Space Art	Space Humanities
	Y2					
	Y3					
	Y4					
	Y5					
	Y6					
Extra-Curricular Activities		Family Learning Night	Space Cinema		Space Camp or Stargazing Evening	
						Run/Walk to the Moon Challenge

Suggested Week Overview

In the second example, the school has a specific whole-school theme for the Space Week and all their activities are related to that. There is more planning and creativity needed from teachers in running this type of Space Week but it can be very rewarding.

The theme could be the Solar System, Space Exploration, Working in Space, the Space Race Mission to Mars or the Moon. In this particular example the whole-school theme is Stars and Astronomy. You can see that the school have planned to use relevant books as a stimulus for many of the sessions and there is a good balance of both creative activities and science-focused enquiries linked to the theme.

Through having the same activities for KS1, lower KS2 and upper KS2 you can provide greater opportunity for collaborative planning. You could even have different teachers in the key stage lead specific sessions on a rota and mix up the classes, so children get the opportunity to collaborate with different groups of children – really helping make your Space Week stand out from the normal curriculum.

➤ There is a blank template for a Space Week overview plan in the appendices to help you with your planning.

Sample Plan 2 – Stars and Astronomy Space Week

		Monday	Tuesday	Wednesday	Thursday	Friday
Assemblies		Launch Assembly	Inspirational People Assembly – Story of Mae Jemison	Visit from an Astronomer	Pupil-led assembly based on Older than the Stars	Celebration Assembly
		SPACE-THEMED CONTINUOUS PROVISION / Child-led enquiries				
AM		<i>THEME: Astronauts</i>	<i>THEME: Rockets</i>	<i>THEME: The Moon</i>	<i>THEME: Aliens</i>	<i>THEME: Stars</i>
EYFS	Y1	Science enquiry – Investigating shadows from the Sun – human sundial	<i>Class story: 'Zoo in the sky' by Jaqueline Mitton</i> Constellations and the seasons – making constellation projectors	<i>Class story: 'A hundred billion trillion stars' by Seth Fishman</i> Maths Morning – Super big space numbers	Comets look like stars, but they aren't. What are they and how do we know? 'Once upon a time' Rosetta research project	Making a comet demonstration Writing a postcard from a comet
	Y2					
	Y3	Science enquiry – Observing over time. How does the light on the playground change over the day? Planning and data collecting	Science enquiry – How does the light on the playground change over the day? Looking at data from the data logger, drawing conclusions and making posters to communicate findings.	<i>Eclipse myths and superstitions.</i> After sharing a variety of myths and superstitions about an eclipse and learning what an eclipse is children will plan and write their own short myths about an eclipse.	<i>Class story: 'On a beam of light: A story of Albert Einstein' by Jennifer Berne</i> Drama – based on children's improvisation. The life of Albert Einstein	<i>Class story: 'On a beam of light: A story of Albert Einstein' by Jennifer Berne</i> Drama – rehearsals and prop development.
	Y4					

Suggested Week Overview

AM	Y5	Big telescopes – activities linked to the Webb Space Telescope	<i>Class story – 'Hidden Figures' by Margot Lee Shetterly and Winifred Conklin</i> Comprehension and writing a book review	Investigating UV from the Sun – Mission Starlight enquiry	Science enquiry – What factors affect how high a water rocket will reach? Planning and constructing rockets	How do astronomers understand stars from looking at their light? Making a spectrometer
	Y6					
Lunch		Observing Sunspots Activities				
		SPACE-THEMED CONTINUOUS PROVISION / Child-led enquiries				
EYFS		<i>THEME: Astronauts</i>	<i>THEME: Rockets</i>	<i>THEME: The Moon</i>	<i>THEME: Aliens</i>	<i>THEME: Stars</i>
PM	Y1	Sun poetry	Creating our own constellation creatures and writing their stories	Drama and dance. Children create their own performances about sunlight travelling to Earth and the effects it has.	Building Rosetta models	Space cinema: Fly me to the Moon
	Y2					
	Y3	Sun art using photographic paper outdoors.	Pupil-led science enquiry – research to find the answers to the children's questions about the Sun.	<i>Eclipse myths and superstitions.</i> Finish story writing	<i>Class story: 'On a beam of light: A story of Albert Einstein' by Jennifer Berne</i> Drama – based on children's improvisation. The life of Albert Einstein. Rehearsal and prop making	Final rehearsal ready for performance for parents at 2.30pm
	Y4					
Y5	Investigating lenses – making and testing a telescope	Maths challenge – Building a scale model of the Ariane V rocket that will be taking the Webb Telescope to space	Investigating UV from the Sun – reporting findings in posters	Science enquiry – what factors affect how high a water rocket will reach? Data collecting and analysis using Excel	Space cinema Hidden figures	
Y6						
After-school Session			Stargazing Evening KS1		Stargazing Evening KS2	

External Visitors

There are a number of external visitors who could support your Space Week, including STEM Ambassadors, outreach officers from a local university or people working in local industry. They could support: classroom learning activities, lead assemblies, talk about their work or just be the expert in residence, to respond to the children's many questions about space. When children get to meet a variety of people who work in different areas of science it helps them see the relevance in their learning as well as develop their science capital and aspirations.



Image: Astronomy Professor, Andrew Levan, talking to Year 3 pupils about the ESA Rosetta mission

There is a list of useful contacts in universities as well as local amateur astronomy groups in the appendices that will help you with your planning.

> External Visitor Checklist

Administration before the event:

- Check that the visitor has a current DBS; ask them to bring their DBS certificate into school for the safeguarding officer to see.
- Gather risk assessments from your visitor and share with school staff before the event.

To help your visitor to prepare for the session:

- Tell your visitor about where their session fits in with your topic. Discuss your hopes for the session.
- Give your visitor guidance on any specific needs that your children may have.
- Confirm the date and time of the event.
- Provide your visitor with advice on travelling to your school and advise them on car parking.
- Ask how they would like the room set out on the day.
- Ask your visitor what materials you need to provide for the session.

External Visitors

To prepare at school:

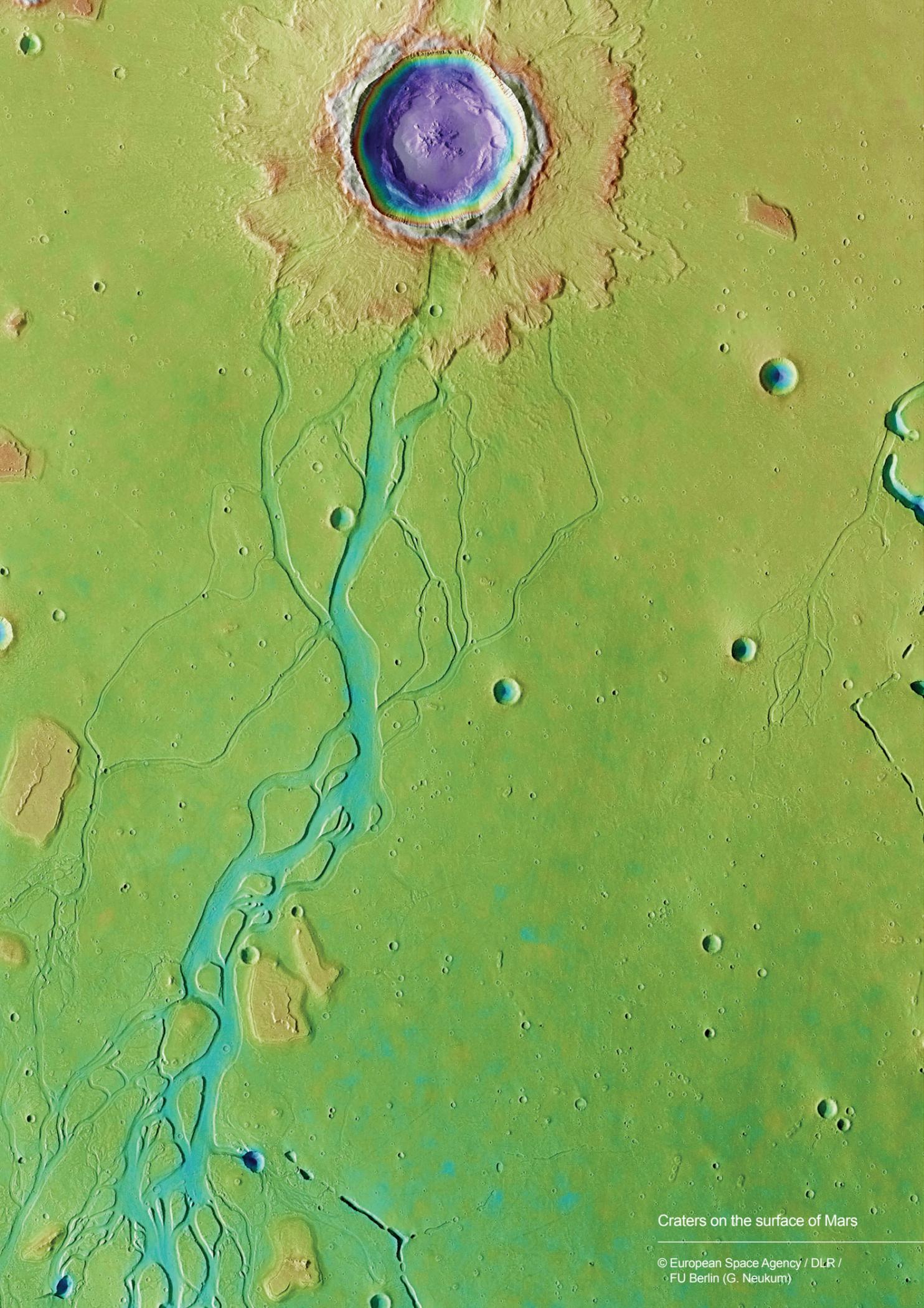
- Check school calendar.
- Book a car parking slot near to the school building.
- Book rooms or the school hall.
- Inform school caretaker and ask them to help prepare for the session.
- Arrange for someone to meet and greet your visitor.
- Ensure that you inform other members of staff that your visitor will be in school.

To prepare your class:

- Think about what vocabulary the STEM expert is likely to use, pre-teach these words so that all children can access the session.
- Ask the children to think about what questions they could ask their visitor.

Safeguarding

NB: It is important to follow your school's safeguarding policy regarding inviting visitors into school. Ensure that your visitor is well briefed prior to their session and that you have planned who will support them in school during their visit.



Families

You may have families who would be keen to get involved in supporting science learning in your school. There are numerous ways for parents to be involved in promoting healthy attitudes to science, sharing how science is relevant to their working lives or simply by being positive and joining in with learning.

Dear families,

It's only _____ days until Space Week! This is a special time when the whole school will be learning together about our incredible universe. Not only will we be making some amazing astronomical discoveries but we would like to start a conversation about how science is important in our everyday lives too here on planet Earth. We want our children to be curious scientists and to understand how science fits in with their daily lives. This is an important discussion and we would value your help.

Please would you also consider supporting your child's learning by helping us in one of the following ways?

> STEM Detectives

Think of a time in your day-to-day life when you use science, mathematics, technology or engineering? Could you be a STEM Detective on behalf of the children?

Please take a selfie of yourself doing something that links to one of the STEM subjects and then tweet it to school using our Twitter address – @SCHOOLTWITTERACCOUNT #STEMDetectives – with a short line about how you are using STEM in your workplace.

We will enjoy sharing your posts with the children as they discover STEM in their local environment.

> STEM Profiles

Do you have a job that involves any of the STEM subjects? Could you come in and be interviewed by the children?

Please consider coming in to school for a short interview by the children.

There is no need to prepare for your interview, just answer their questions simply and honestly. To get the conversation started, perhaps bring a tool, photo or object which you use in your work. From these interviews, the children will begin to understand that they can use their learning beyond the classroom.

> STEM Supporters

Could you come into school and help during our Space Week?

We will be enjoying learning about the universe together. You don't have to be an expert in astronomy, just keen to come and join in the fun. All extra pairs of hands would be really valuable to us. As you work with them, perhaps you can ask them what they enjoy about science and find out about their learning? This would show the children that science learning is important.

Thank you for your support. We appreciate you taking the time to help your children discover that science is important right here in our community and look forward to sharing our Space Week adventures with you.

Craters on the surface of Mars

© European Space Agency / DLR /
FU Berlin (G. Neukum)

Assembly Menu

The world of space exploration is full of inspirational stories and opportunities to promote in-depth thinking about our universe. Choose from our menu of starting points to create your own space-themed assemblies.

Theme	Poetry / Stories	Songs / Music	Questions to think about
How did it all start?	<p>'Older than the stars' – Karen C Fox & Nancy Davis</p> <p>This beautifully illustrated book explores our most fundamental relationship with the moments when the world began. Children could perform this story – it is a poem with lots of repetition, which could be used as a stimulus for a class assembly. www.youtube.com/watch?v=Lp1_dCIXqSw</p>	<p>'What a wonderful world' – Louis Armstrong www.youtube.com/watch?v=A3yCcXgbKrE</p>	<p>How old do you think you are on other planets?</p> <p>What do other religions say about the way the world began?</p>
Mae's dream: The story of astronaut Mae Jemison	<p>'Mae among the stars' – Roda Ahmed & Stasia Burrington</p> <p>Mae Jemison was the first black woman to become an astronaut. This is the inspirational story of her great dream that became a reality. www.youtube.com/watch?v=b_mfdqyBqT8</p>	<p>'Reach for the stars' – S Club Seven www.youtube.com/watch?v=50kP4S0peAs</p> <p>'We're all made of stars' – Gary Barlow www.youtube.com/watch?v=yRYvOdAdXk0</p>	<p>What do you want to be when you grow up?</p> <p>What's your dream?</p>
Super scientist: Albert Einstein	<p>'On a beam of light: A story of Albert Einstein' – Jennifer Berne</p> <p>This is the story of the father of modern physics. When Albert was a child he was slow to learn to speak and branded disruptive at school. However, Albert was brimming with curiosity. He began to ask questions about the world around him and his journey led him to make huge scientific discoveries. www.youtube.com/watch?v=-4YTFAiSUi4</p>	<p>'The sky's the limit' – Nik Kershaw www.youtube.com/watch?v=RL_rYCgn6uk</p>	<p>What question would you like to answer?</p> <p>Where do you do your best thinking?</p>
Starry, starry night: Vincent Van Gogh	<p>'Katie and the starry night' – James Mayhew</p> <p>Join Katie on her magical journey into her favourite painting called 'Starry night'. As Katie plays in the art gallery, she is surrounded by thousands of stars. www.youtube.com/watch?v=QAPjNmSc4M</p> <p>Dramatised autobiography of Vincent Van Gogh: www.bbc.com/bitesize/clips/z4pvcdm</p>	<p>'Starry, starry night' – Don McLean www.youtube.com/watch?v=oxHnRfhDmrk</p> <p>'Starry, starry night' – Ellie Goulding www.youtube.com/watch?v=bw8zr1n-MFo</p>	<p>What is the best thing about the 'Starry night' painting?</p> <p>If you could wish upon a star, what would you wish?</p>

Assembly Menu

> Silly Assembly Games

Astronaut Dressing Up Race:

You need:

- two white paper overall suits,
- two cardboard helmets – boxes covered in foil,
- two pairs of welly boots,
- two pairs of gardening gloves
- a giant dice.

Divide the school into two teams. Before the assembly choose two teachers to dress up – have them in shorts and t-shirts ready for the game.

Choose people to roll the giant dice. If they roll a six then their person can put on one piece of their astronaut outfit. Who will win?

Moon Rock Collecting Race:

You need:

- two teachers dressed as astronauts,
- a paddling pool filled with small balls.

Give each astronaut a fishing net – race against the clock. They must moonwalk between their base and the moon rocks. Who can collect the most moon rocks in two minutes?

> Solar System Race

Around the school hall there are beach balls – one for each planet in the solar system. Have two teachers on space hoppers. Give them a question and they have to race to the correct planet. First one there gets the planet and the point. Best of three.

1. Which planet is the smallest in the solar system? **MERCURY**
2. Which planet is named after the Roman God of War? **MARS**
3. Which planet is named after the English and German word meaning the 'ground'? **EARTH**
4. Which planet is named after the Roman God of the Sea? **NEPTUNE**
5. Which planet is known as Earth's sister planet, because they are so similar? **VENUS**

Assembly Menu

> Assembly Space Quiz

Which of these 'facts' about the Moon are true? Cut up a moonscape picture into segments. As the team gets a question correct, they win a segment of their moonscape. First team to complete their picture of the Moon wins.

Fact or Fiction?	Answer
The Moon is made of cheese.	FALSE. It is made from rock.
One side of the Moon is always dark.	FALSE. The Moon rotates on its axis. So different parts of the Moon will be in darkness at different times over the lunar day.
A lunar day lasts a fortnight.	TRUE.
There is no gravity on the Moon	FALSE. The gravity on the Moon is about one sixth of that on Earth.
We always see the same side of the Moon from Earth.	TRUE. The Moon and the Earth are in synchronous rotation. So, we always see the same side of the Moon from Earth.
The Moon rotates much more slowly than the Earth does.	TRUE. Earth takes 24 hours to turn once on its axis. The Moon takes about 29 days for one lunar cycle.
You only see the Moon at night.	FALSE. You can see the Moon on average for six hours in daylight.

Moonscape images available from: www.schoolsobservatory.org/learn/astro/solsys/moons/earthmoon
 Questions taken from: www.stem.org.uk/system/files/elibrary-resources/legacy_files_migrated/28075-Teacher%20Planning%20Pack.pdf

Whole School Events

There are lots of opportunities to get the school community working together and sharing their learning during Space Week.

> Science Fair

A space-themed science fair is an excellent way to engage pupils across the school, develop their love of learning at home and encourage pupil leadership. The idea is that you launch the space science fair four to six weeks before your Space Week with a launch assembly and sending an information pack home to parents and carers.

Children then work on their own individual projects linked to space about areas that interest them; you could encourage collaboration by accepting paired entries. Children present their projects on project boards made from old boxes covered in wrapping paper. The project boards can then stand freely on tables for children to share their learning. Projects could be a science enquiry, a research project or children could have identified a problem that they have come up with a solution for.

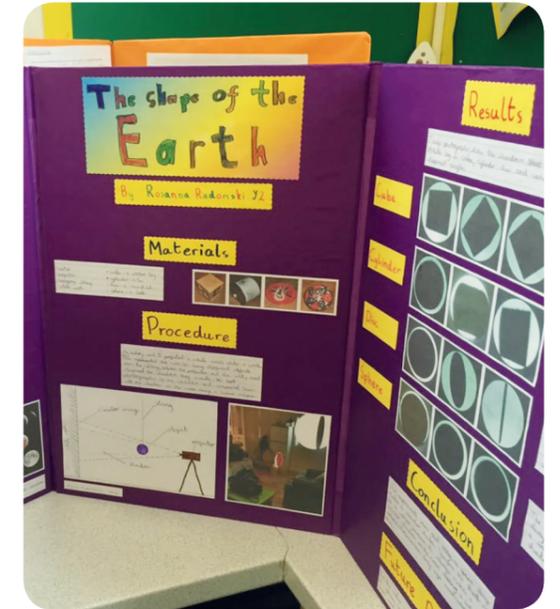


Image: A space-themed science fair project

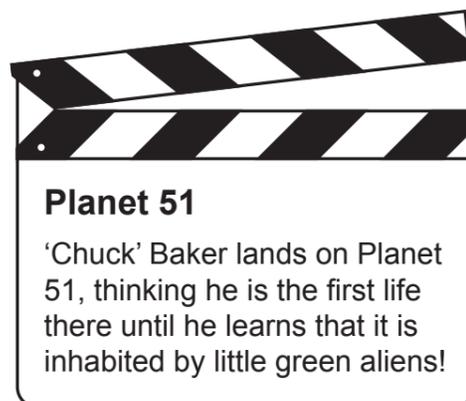
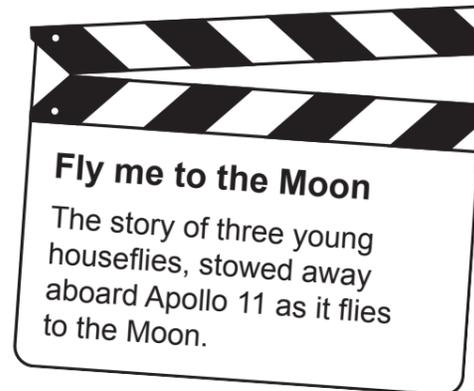
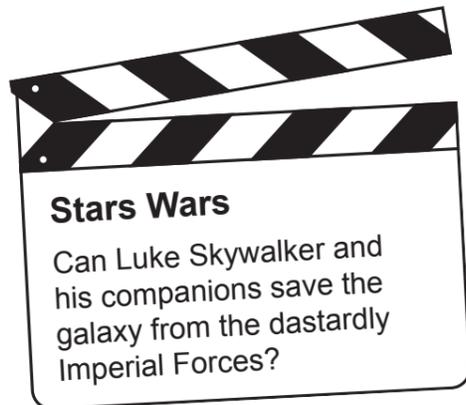
You can then hold your science fair in Space Week, where children who have completed projects stand beside them in the school hall to explain their project to visitors and judges (if you decide to add a competitive element). It is a great event to invite parents, carers and school governors to.

You could even consider linking your Space Week with the **Great Science Share** in June, a national campaign to engage young people in sharing science learning with new audiences. Visit their website to find out more and for some really useful information and advice on running such events in your whole-school community.

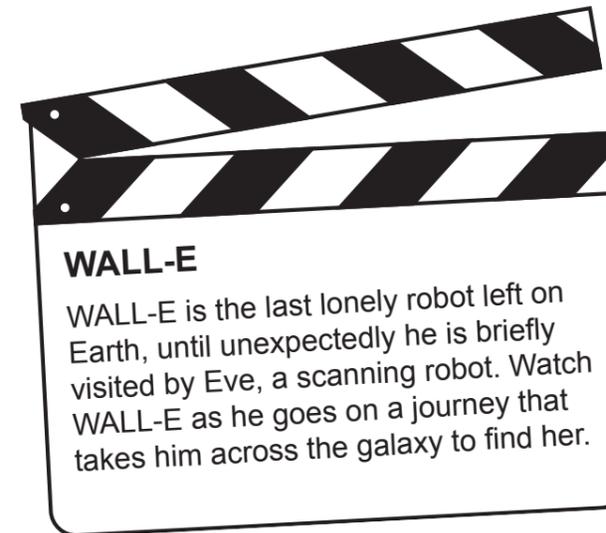
Whole School Events

> Space-Themed Movie Night

Why not hold a movie night and invite families in to share a space-themed movie together? Get the popcorn out, relax and enjoy the show!



Whole School Events



> Movie Night Checklist

- Select movie and check that school has the relevant copyright licence. www.gov.uk/guidance/copyright-licences-information-for-schools
- Advertise your event to parents and carers – via newsletter and tweets. Encourage your children to create posters and tickets for the event.
- Ask the site manager to book the hall and set it up on the night.
- Ask the office staff to oversee bookings for your event. Ensure that they check the safe fire capacity of the hall AND only release that number of tickets for your event.
- Carry out a risk assessment. What support might your families need on the night? Consider: Access & Inclusion arrangements for all, fire alarm muster points, first aid, school security.
- Check your equipment – projector, computer and sound. If you have an IT technician ask them to support and attend your event.
- Ask PTA to serve cold drinks and snacks. OR ask your children to run a simple refreshment stall.
- Arrange for some of your children to act as ushers on the evening, help people to their seats and ensure that the night goes smoothly.

Whole School Events

> Competitions

Here are some ideas for competitions that you could run throughout Space Week, either for children to work on in class-time or at home with their families.

Space Engineer Challenges – Creative challenges inspired by engineering

Space Engineers: aged 5-7

Rocket-making competition. Make a rocket to take you up and away into space. Use any household junk to create your rocket.

Space Engineers: aged 7-9

Design and make a moon buggy to collect samples from across the Moon's surface. Your buggy will be tested across bumpy terrain.

Space Engineers: aged 9-11

Imagine you work in the space industry designing robots and machines. Design your own space robot. What does it do? How does it work? Create a labelled poster about your space robot.

Star Author Challenges – Writing challenges inspired by space

Space Author: aged 5-7

Twinkle, twinkle, little star.
How I wonder what you are?
Up above the world so high
Like a diamond in the sky.
Twinkle, twinkle, little star.
How I wonder what you are?

'Twinkle twinkle little star' was from a poem called 'The star' by Jane Taylor, which was written nearly 200 years ago.

Create your own poem about stars. How do they shine? What can you see on a clear night?

Space Author: aged 7-11

When you look to the stars, it is easy to see patterns. These patterns are called constellations. They are often named after an animal or a mythological figure. Many constellations have inspired legends or stories which explain how they came to be.

Different cultures can have different names for the same constellation, for example, the seven main stars in The Great Bear are also known as The Big Dipper, The Plough, Seven Stars or The North, or The North Dipper.

Create your own constellation, give it a name and write its story. How did the constellation come to be? OR Where did the constellation get its name from?

Astro Art Challenges – Artistic challenges inspired by space

Astro Artist: aged 5-7

Vincent Van Gogh painted a famous picture called 'The starry night'. Some of the painting is of things he could see from his window. Other parts of the painting are from his own imagination.

Create your own 'Starry, starry night' picture. It could include the view from your bedroom window on a starry night, or it can be from your imagination.

Astro Artist: aged 7-11

The super-powerful telescopes in the Hubble Space Observatory help us to see far out, into deep space. They reveal clouds of dust and gases known as nebula. Here in these stellar nurseries, stars are born. Nebulae can be millions of light years wide; they are lots of different shapes. Many have been named after animals, such as the Cat's Eye Nebula, Horsehead Nebula, Crab Nebula, Eagle Nebula and Butterfly Nebula.

Create your own nebula picture using images from the Hubble Space Telescope to make it as realistic as possible.

Whole School Events

> Family Learning Night

A Family Learning event is a great way to engage your wider learning community with your Space Week. A Family Learning night would normally happen during early evening. The event is based around a talk by someone who is a specialist in space science, such as a STEM Ambassador, and astronomer or astrophysicist from a local university, an expert from a local amateur astronomy group or someone who works at a local aerospace company who can talk about their work. You may already have a parent or carer in your school community who could do this.



Image: Tim Peake talking to school children in the Space Zone on Futures Day

A space-themed Family Learning event could also involve a stargazing session, involving your local amateur astronomy group, which will ensure that there are plenty of experts and telescopes to hand. Again, children or members of their family may have their own telescopes or binoculars that they could bring along. Having iPads available with a free star map app is always handy during this kind of event and really engages children in the stargazing activity.

Amateur astronomy groups can also be a great source of professional development for teachers wanting to lead their own stargazing and Family Learning nights. Most amateur astronomy groups have a regular programme of speakers – attending such sessions may help you to find other local space experts who could come and share their knowledge with your pupils.

The event could be made more hands-on by including a variety of 'make and take' activities such as making a constellation projector, making a planisphere or a simple orrery. These activities could be run by older pupils in the school, encouraging pupil leadership.

If you are feeling like taking on a challenge you could even try to organise a large-scale Family Learning night at your local university in one of their lecture theatres. You could even book a really exciting speaker which will likely incur a fee, but you could sell tickets through an online ticket provider to cover the cost. There is a useful section of contacts for speakers in the appendices of this guide.

Ideas for enhancing your continuous provision within your setting along the space theme.

<p>Water</p> <p>Moon sand in water troughs.</p> <p>Moon sand is hydrophobic and is great for modelling underwater.</p>	<p>Sand – Moon surface</p> <p>Cover a builder's tray with tinfoil. Cover it in black sand. Encourage the children to draw pictures or write their name in the moon sand. Collect the sand into jars, leave funnels and spoons out for the children to play with.</p>	<p>Construction</p> <p>Construction toys or junk modelling to make a moon buggy, rocket launch pad, rockets.</p>	<p>ICT</p> <ol style="list-style-type: none"> 1 Use a digital microscope to look at moon rocks close up (just use stones from around the setting that the children have collected). 2 Space-themed Bee-Bot® – can you pilot around outer space? (Make a space-themed mat to drive the Bee-Bot® around.)
<p>Painting</p> <ol style="list-style-type: none"> 1. Lay paper in a salad spinner and add runny paint. Turn the handle to create a spatter pattern. 2. Paint flicking to make starry skies. Encourage the children to paint their own Jackson Pollack galaxy paintings (best done outside on large sheets of paper!) 3. Create big planets out of coloured paper. Use the children's feet to paint the planet's surface. 4. Marbling ink planets. 	<p>Malleable</p> <p>Add sparkles to Play-Doh for children to create, mould or make space models: aliens, stars, planets. Add pipe cleaners, googly eyes and other bits such as bottle tops or lids to make aliens.</p>	<p>Science enquiry</p> <ol style="list-style-type: none"> 1. Set up a dark den, with torches of various colours. Place luminous stars, lighting up toys, mirrors and non-reflective objects in there. Encourage the children to find out what happens if they shine their torch on different surfaces. Do they all reflect light? Which toy shines the brightest? (You can usually collect very cheap light toys in the autumn...) 2. Set out torches and some simple shadow puppets – shapes on long sticks or rulers. Encourage the children to cast shadows onto the wall. What do they notice? 	<p>Maths</p> <ol style="list-style-type: none"> 1. Counting: <ul style="list-style-type: none"> • How many stars can you see in 'Starry night' by Vincent Van Gogh? • Make lots of paper stars. Count the points on the star. Put that number of glass beads onto it. 2. Weigh moon rocks on bucket scales. 3. Create moonboot prints – dip wellies in ground chalk and leave moonboot prints. Measure them with strips of paper – find the shortest/longest / order the boot prints. 4. Number fishing – use a magnetic fishing rod to collect the sparkly rockets from the sand. Put them into order. 5. Create rockets and spacecraft from 2D shapes. 6. Create a moonscape picture or using your small world – moonscape: ask the children to land their rocket. Encourage them to use positional language... on/off/next to/behind/in front.
<p>Small world</p> <p>With the children create a moonscape with egg boxes and papier mâché... Litter it with glass beads, small pebbles, small rockets, buggies, astronauts, sandy areas, volcanoes. Place the moonscape either in sunlight or in darkness for a different atmosphere.</p>	<p>Fine motor</p> <ol style="list-style-type: none"> 1. Threading asteroids – sparkly beads or baubles. 2. Sewing cards – stars, planets, etc. 3. Use tweezers to collect small moon rocks into a bucket. Sort the moon rocks into different colours. 4. Make a funky alien hat by threading pipe cleaners through the holes of a colander. 	<p>Mark making</p> <ol style="list-style-type: none"> 1. Paint a simple maze on the playground floor or on wallpaper lining... Ask the children to find the shortest route from the rocket to the planet, using chalk to mark their route. 2. Spray shaving foam over metal baking trays and encourage children to write in the foam. Pretend that their rocket is flying through clouds of space clouds – what pattern does it make? 3. Design your astronaut's patch for their spacesuit. 	
<p>Role play – Trip to the Moon</p> <ol style="list-style-type: none"> 1. Create a rocket from boxes and foil. Lay out: astronaut suits, bulky gardening gloves, wellies, buckets, fake boulders, real stones and pebbles, ride-on toys to use as moon buggies. Tubes to act as telescopes. 2. Put out tools and workstations and gardening gloves. Imagine you are an astronaut fixing your rocket. 	<p>Songs</p> <ul style="list-style-type: none"> • Five little men in a flying saucer • Twinkle twinkle little star • Hey diddle diddle. 	<p>Stories</p> <ul style="list-style-type: none"> • 'Here come the aliens' – Colin McNaughton • 'Aliens love underpants' – Claire Freedman and Ben Cort • 'Aliens in underpants save the world' – Claire Freedman and Ben Cort • 'The dinosaur that pooped a planet' – Tom Fletcher • 'Q Pootle 5' – Nick Butterworth • 'Whatever next!' – Jill Murphy • 'Roaring rockets' – Tony Mitton • 'How to catch a star' – Oliver Jeffers • 'The star in the jar' – Sam Hay • 'Moon' – Patricia Hegarty. 	<p>Writing</p> <ol style="list-style-type: none"> 1. Space writer backpacks – a rucksack with notepads, sparkly pens, walkie-talkies, telescopes, clipboards... so that they can write notes or lists from wherever they are playing. What can you see? 2. You are an astronaut. Write a list of what you need to pack in your rocket for your mission. 3. You have arrived on the Moon. Write and draw a postcard home to your family (provide blank postcards). 4. Create a space passport – fill in your details ready for your trip to the moon base.
<p>Sound</p> <ol style="list-style-type: none"> 1. Listen to Holst's 'The planets' – how can you move your body to go with the music? 2. Make spacey sound effects with wind chimes, pots and pans, washboards, boom-whackers. 	<p>Sensory</p> <p>Line a tray with tinfoil, add other reflective objects such as beads, crystals and sequins that glitter and shine.</p> <p>Make green alien slime from cornflour and water.</p>		



Key Stage 1

Space can be a great context to support lots of learning across key stage 1 or just be something to learn about for the sheer joy of it. There is a vast collection of space education resources linked to science learning that can be easily accessed online. One of the best places to find age-appropriate resources is the ESERO-UK library which can be accessed from the National STEM Centre website: www.stem.org.uk/esero. There are thousands of resources in the STEM eLibrary, a selection of which are listed below. These have been organised into thematic approaches which could provide a good launch pad for enquiries amongst key stage 1 children.

> Science

Exploring space

Who is Paxi?

In this animated film we meet ESA's mascot Paxi, an alien who flies about in his spaceship, learning about planet Earth. He compares features of the Earth to his home planet, looking at similarities and differences.

www.stem.org.uk/resources/elibrary/resource/162655/who-paxi

Explore the future

Written for the 2014 British Science Week, this resource includes lots of simple classic space activities such as a shoebox planetarium and a fruit solar system.

www.stem.org.uk/elibrary/resource/34274

Rocket game

This space-themed maths game provides an opportunity for children to practise working with number bonds to ten. It can be played either as a board game in pairs or used within an interactive whiteboard page.

www.stem.org.uk/resources/elibrary/resource/35358/rocket-game

To infinity and beyond

A thematic unit on a voyage to space. This exciting resource is created especially for learners who respond well to sensory activities or have profound learning difficulties. It includes a wide variety of sensory activities, songs and crafts.

www.nicurriculum.org.uk/curriculum_microsite/SEN_PMLD_thematic_units/dep/docs/IB_WEB_Files/IB_Overview/To_Infinity_and_Beyond.pdf

CBeebies stargazers

Join Maggie and Chris as they explore the wonders of the night sky and the universe. The series website has a host of short films made for children in key stage 1, where they can find

Key Stage 1

songs, question and answer sessions, games and quizzes. Some episodes are available on iPlayer and CBeebies radio podcasts.

www.bbc.co.uk/cbeebies/watch/stargazing-bedtime-song

Comets

Rosetta

In this animated film, Paxi the alien takes you on a voyage around the solar system, introducing you to the life of a comet as it flies around the Sun. Paxi describes how comets' tails form. Paxi then tells you all about the Rosetta space mission to Comet 67P, and answers the question of how to land the Philae lander on the comet's surface. Rosetta is helping to answer the mysteries of the origins of life on Earth.

www.stem.org.uk/resources/collection/4183/rosetta-primary-classroom

Once upon a time

Watch these animated stories of Rosetta making its epic journey to Comet 67P.

www.stem.org.uk/resources/elibrary/resource/169251/once-upon-time

Astronauts

ESA – Life in space

Find out what it takes to become an astronaut. Read profiles of many ESA astronauts. Discover what life is like in space and how they adjust to life back on planet Earth afterwards.

www.esa.int/esaKIDSen/Astronauts.html

A day in the life on a space station

A NASA resource for educators, which can be used as background information on life as an astronaut.

www.nasa.gov/audience/foreducators/stem-on-station/dayinthelife

Living in space

Rocket science

We all know how important it is to eat your greens. Well the rules apply to astronauts too! In this booklet of activities linked to the idea of growing plants in space, children are encouraged to design an astro-garden full of plants for an astronaut to eat, think about why astronauts need fresh food in space and design a greenhouse for growing plants.

www.stem.org.uk/resources/elibrary/resource/47139/rocket-science-primary-schoolse-resource-pack

Key Stage 1

Planet Earth

Colour in the Earth (EO Detectives)

Have your children ever wondered what the Earth looks like from space? This resource was created from some of the images taken by astronaut Tim Peake from the International Space Station (ISS). This resource uses some of these to support children in recognising features from an aerial view, and develop their understanding of maps and keys or legends.

www.stem.org.uk/resources/elibrary/resource/319216/colour-earth

Looking into space – telescopes

Webb Telescope funpage

The James Webb Space Telescope will be a large infrared telescope with a 6.5m primary mirror. The telescope will be launched on an Ariane 5 rocket from French Guiana in 2021. Its mission is to uncover the history of the universe from the Big Bang, to look for alien planet formation and to discover how galaxies are formed. This booklet of activities is packed full of dot-to-dots, word searches, crosswords, colouring sheets and fun facts about the James Webb Telescope.

jwst.nasa.gov/education/JWSTScienceFunPad4-6-11.pdf

Mars

Do Martians exist?

An animated film with Paxi the alien. In this film, Paxi compares things that are alive, with things that are either no longer alive or have never been alive. Searching the planet for any signs of life, Paxi asks could there be life on Mars?

www.stem.org.uk/resources/elibrary/resource/162651/do-martians-exist

Mars adventure – online game

In this fun game, players must select ten items to take on their mission to Mars. They must think about packing wisely, items must keep the crew fit and healthy, and occupied on their long journey. Watch the rocket take off and discover how useful your items were to the astronauts!

spaceplace.nasa.gov/mars-adventure/en/

The Mars diary

A beautiful, interactive resource to enable children to discover real-life STEM projects that are exploring ways to get humans to Mars – in particular, the UK's human and robotics exploration programmes. Produced by Lucy Hawkins and an expert team, this resource

Key Stage 1

is designed to support much of the key stage 2 curriculum. However, ideas might also be tweaked to enrich learning in key stage 1 and would be of interest to children with a passion for space exploration.

www.marsdiary.org

> Ideas for more practical science enquiries:

Here are a few ideas for practical science enquiries which might inspire your children's curiosity!

- How can we use the Sun to tell the time? Can we make a human sundial?
- Make a weather station to record the weather here on planet Earth. How much cloud cover is there? What do you predict the weather will be like tomorrow, in a month, in three months' time?
- How can we measure wind? What's the best weather for launching a rocket?
- What happens to UV beads in sunshine? Do they still change in different weathers? How do different amounts of cloud cover affect how they change?
- Which material would be best for an astronaut's visor? Which material would be best for an astronaut's suit?

> Literacy

Writing opportunities

- Imagine you are in space, write a postcard home to tell your family all about it. What can you see and touch?
- Design your own constellation; give it a name. Tell us about your picture.
- Create a classroom observatory. Create the shapes of the Moon, constellations or comets and hang them around the classroom. Make cardboard telescopes, set up notepads and journals for children to record their observations. Have a look at the incredible images of the night sky on the National Schools' Observatory website: www.schoolsobservatory.org/about. Write descriptions of your astronomical observations.

Key Stage 1

Booklist

'Zoo in the sky' – Jacqueline Mitton

Discover the legends of animal constellations in the night sky.

'A hundred billion trillion stars' – Seth Fishman

Lots of huge numbers reveal the enormity of our universe – this book will blow your mind!

'How to catch a star' – Oliver Jeffers

A boy loves stars so much that he tried to catch his own.

'Our stars' – Anne Rockwell

What is a star? All about what we can see in the sky on a clear night.

'Beegu' – Alexis Deacon

Beegu, a friendly little alien creature, is lost on Earth. Will she find her way home?

'Man in the Moon' – Simon Bartram

Learn about Bob, the man who cares for the Moon.



> Maths/Computing

- Programme a Bee-Bot® to move around a space map. The children will use directional and positional language.
www.stem.org.uk/rx358a
www.twinkl.co.uk/resource/t-t-26668-space-themed-bee-bot-mat
- Make straw rockets and measure how far each version flies.
www.stem.org.uk/rxtm8
- Make rocket mice – ask the children to measure how far they fly. Encourage children to change the size of the bottle to see how that affects how far the mice fly.
www.stem.org.uk/rxfjyn
- Use Kodu to make simple spacescapes and simple games.
www.stem.org.uk/rx358a
- Solar System Simulation Scratch and unplugged activity:
www.stem.org.uk/rx358g

Key Stage 1

> Humanities/Technology

- Create a classroom weather station to be continued over the year.
www.metoffice.gov.uk/learning/weather-for-kids/weather-station
Set up a range of weather monitoring equipment including homemade rain gauges and an anemometer – to determine wind speed and wind vanes – to determine the wind direction. The children could also estimate the cloud cover and record the colour of the clouds. Schools may also wish to purchase an inexpensive outdoor thermometer and barometer. Create a school-based local weather forecast which could be shared on the school website. Record your weather reports via blogs, vlogs, tweets, newspaper reports, films or in pictures.
- Look at images from satellites or photos taken in space. Look for oceans, mountains, ice sheets, deserts, look for the shapes of the continents, identify key locations such as the North or South Pole. Consider, do you think you can see the Great Wall of China from space? Compare images of the Earth at night and in daylight. What is the same? What is different?
Images available through:
 1. EO Detectives:
www.stem.org.uk/resources/collection/4356/eo-detective
 2. 'Hello, is this planet Earth?'
By Tim Peake. Published by Century (2016) ISBN-10: 1780897154
- Explore using the Sun's rays to cook by making a solar oven.
www.eonenergy.com/-/media/PDFs/About-Us/community/energise-anything/power-solar-oven.pdf

> Art/Music

- Investigate pictures of the night sky:
'The great comet of 1680 over Rotterdam' – Lieve Verschuier
'Starry night over the Rhône' – Vincent Van Gogh
'The meteor of 1860' – Frederic Edwin Church
Try mixing a colour pallet to match the colours you see in the painting.
Create your own versions but using the landscape of where you live.
Recreate the picture in a different medium – oil pastels, watercolour or collage.
- Look at the painting 'Starlight night' by Georgia O'Keeffe. Create your own version using Brusho®. Get the children to experiment and to find the best way to make the stars – try wax crayon, PVA glue, leaving spaces, white paint.

Key Stage 1

- Create simple press prints of the night sky or shapes of stars or comets dancing through the sky or constellations. (Think about which way round the constellations will print!)
- Use sun print paper to use the power of the Sun to create simple images. This photographic paper uses natural sunlight to develop an image. Simply place objects onto the surface of the light sensitive paper and leave it outside in the sunshine.
- Set up a pendulum, fill it with sand and set it going. What shapes does it naturally make? To make the pendulum, take a small bottle, make a hole in its cap; suspend it upside down from a string; tie string onto a dowel and place it over a large box. Try using different coloured sand.

> PSHE

- What would you take on a journey to the Moon? Explain to the children that astronauts take everything they need with them. Ask your children to choose the five most important things they would take with them to the Moon and why.
stfc.ukri.org/files/1-1-things-to-take-to-the-moon/
What are the essential things we need to keep alive? What extras would we take to make us comfortable?
- Planet Earth is our spaceship. What does it mean to care for our planet? Why does it matter? Look at the photos of the Great Pacific Garbage Dump or the Plastic Island in the Caribbean Sea. Watch this extract from the Go Jettors:
www.youtube.com/watch?v=_hSjLManw84
How does this film make you feel? What should or could be done about the plastics problem? What will you do differently?



Key Stage 2

> Science Activities

There is a vast collection of space education resources linked to science learning that can be easily accessed online. One of the best places to find age-appropriate resources is the ESERO-UK library which can be accessed from the National STEM Centre website: <https://www.stem.org.uk/esero>

There are thousands of resources in the STEM eLibrary, a selection of which are listed below. There are so many ways in which the context of space can link with the upper primary science curriculum that it is very easy to select activities and enquiries that would be ideal for a Space Week while continuing to meet the curriculum requirements for that particular year group.

Age	Science Activities from the ESERO-UK Collection
7 to 8	<p>Is there anyone out there? A really useful booklet that has activities to bring aspects of the upper primary science curriculum to life with an exciting context. The Martian Soils activities can easily be adapted to work with 7 to 8 year olds as part of their learning about rocks and soils. www.stem.org.uk/elibrary/resource/30199</p> <p>The Great British Space Dinner A collection of resources for the competition to design a meal for astronaut Tim Peake to eat on the International Space Station. The competition is now closed but the teaching resources can still be used to learn about healthy eating and changes to the human body in space. Children can play their part by creating a healthy meal for an astronaut, by applying their knowledge of human nutrition, good diet and health, and cooking! In the process, they will learn about diet, bone health, astronaut nutrition and the constraints of food and eating in space. www.stem.org.uk/resources/community/collection/16691/great-british-space-dinner</p> <p>Mission X Mission X: Train Like an Astronaut is an international educational challenge focusing on fitness and nutrition to encourage pupils to 'train like an astronaut'. Teams of primary children learn principles of healthy eating and exercise, compete for points, and get excited about space and the educational possibilities for their own future. Children will practise scientific reasoning and teamwork while participating in hands-on training missions targeting strength, endurance, coordination, balance, spatial awareness and more. trainlikeanastronaut.org/</p>
8 to 9	<p>Life of Water The resources in this pack include a set of videos and a teacher notes pack that detail a series of experiments teachers can run with their class when learning about water. Each experiment is set in a space context and includes information for pupils and for teachers. High-quality and engaging resources that will help to bring the chemistry of water to life making learning relevant with a real-life context. www.stem.org.uk/resources/elibrary/resource/108281/life-water</p> <p>Once upon a time Nine fantastic animations telling the story of the Rosetta mission – an absolutely fantastic resource to support science learning, writing and creative learning. There are additional resources to go with the videos that are available from the ESA website. www.stem.org.uk/resources/elibrary/resource/169251/once-upon-time</p>

Key Stage 2

9 to 10	<p>Eggnaut In this resource the pupils' mission is to design and build a vehicle that will protect their Eggnaut from the perils of re-entry from space. The objective is to have your Eggnaut survive the fall without a crack. Great for supporting learning about forces and easily adaptable for challenge. This activity is great for building teamwork and problem solving as well as developing skills in Working Scientifically. www.stem.org.uk/resources/elibrary/resource/25383/eggnaut</p> <p>Investigating Rockets A short, simple enquiry to work on developing skills in Working Scientifically – pupils change the length of the nose cone on a paper straw rocket and measure how far it travels. Pupils can identify variables, repeat measurements, calculate averages as well as tabulated and graphing data. www.stem.org.uk/resources/elibrary/resource/26182/drinking-straw-rocket</p> <p>Space Suit Science A great resource that explores the properties of materials needed for spacesuits with lots of opportunities to develop Working Scientifically skills. Pupils research and learn about a problem, design their own enquiries to find out more, evaluate and adapt their enquiries then finally report their learning through a poster. www.stem.org.uk/resources/elibrary/resource/35714/space-suit-science</p>
10 to 11	<p>Life in a can A cross-curricular resource for primary and lower secondary schools that investigates life and how it can be maintained in the harsh atmosphere of space. The activities within this resource ask 'What is life?' from a human perspective. Pupils consider how we are adapted to conditions on Earth and the ill effects of life in microgravity. www.stem.org.uk/elibrary/resource/35583</p> <p>Crater Shadows This activity involves perspective, modelling, light and shadow. Close-up photographs of the Moon's surface show all sorts of interesting features. Craters are amongst the most interesting, especially when the Sun's light grazes low across the lunar landscape. The aim of the exercise is to recreate a realistic lunar landscape sketch from a real image of the Moon. www.stem.org.uk/resources/elibrary/resource/32592/crater-shadows</p> <p>Training in Space An activity where pupils will be able to discuss various ways of simulating gravity in space and the importance of maintaining a healthy body for the return to Earth. Working in teams of four, pupils should choose their favourite exercise or sport and adapt it for space. They should identify the forces required for their activity and design a way of simulating these forces in space. www.stem.org.uk/elibrary/resource/36664</p>

Of course, no Space Week would be complete without a focus on the planets in our solar system or some rocketry enquiry work. You will find many examples of resources to support lessons on these themes in the ESERO eLibrary, but to save some time the list below directs you to some of the best resources for the primary setting.

Universe in a box

A book or practical activities relating to the solar system including modelling the solar system and eclipses, observing sunspots and building a sundial.

www.stem.org.uk/elibrary/resource/35291

Key Stage 2

Moonsaics

This collection of five moonsaics have been created by the National Schools' Observatory – they consist of five different images of the Moon, separated into multiple picture panels per image, much like a giant jigsaw puzzle. Pupils are challenged to assemble the completed images, offering them the opportunity to fully explore the lunar surface in high definition detail.

www.stem.org.uk/resources/elibrary/resource/27415/moonsaics

Planet Top Trumps

A super set of planet Top Trumps cards that can be printed and laminated. The resource describes a number of different games that children can play with this resource. An ideal resource for working on pattern seeking in science.

www.stem.org.uk/system/files/elibrary-resources/legacy_files_migrated/35167-trumpsnapfish_131.pdf

Design and make a foam rocket

A simple resource aimed at upper primary where children design and make foam rockets. They then carry out enquiries using the rockets, such as how the launch angle affects the distance travelled.

www.stem.org.uk/elibrary/resource/34162

Up, up up!

A really comprehensive teacher guide and pupil activities on rocketry for upper primary from ESA. The resource includes plans and support resources for four activities including research rockets, building and testing paper rockets, building a launch system with a 3D printing element and a rocket fuel enquiry.

www.esa.int/Education/Teachers_Corner/Up_up_up!_build_and_launch_your_own_rockets_TEACH_WITH_SPACE_PR23

Stellarium

A free, open source planetarium that you can download to your computer and share with children on the interactive whiteboard. Stellarium shows a realistic sky in 3D, as you would see with the naked eye or a telescope. Great for taking a tour of the night sky and planet spotting.

stellarium.org

Down2earth

A fantastic collection of resources to learn about asteroids and comets. The Impact Simulator is a wonderful computer simulator that pupils can use to investigate impact craters from various objects.

education.down2earth.eu

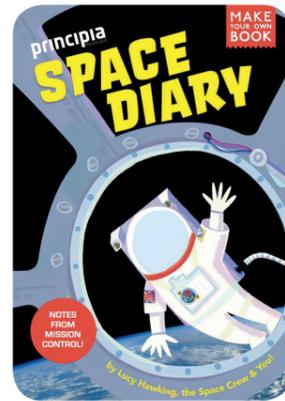
Key Stage 2

> Core Curriculum – English and Maths

There are some fantastic resources that can be used to support the development of skills in mathematics and English that are related to a space context.

The **Principia Space Diary** was written and developed by Lucy Hawking and combines literacy and visual literacy learning with STEM subject learning to create fun and engaging activities for children aged 6 to 8. Visit the website to register and access the entire Space Diary for free, plus lesson plans and differentiated teaching materials, games and extension activities.

principiaspacediary.org



The **Unlimited Space Agency Astro Science Challenge** is a space science adventure for children aged 7 to 11 inspired by Tim Peake's mission to the ISS. There are a set of 18 fantastic activity plans that focus on English, maths and science that you can download from the website. Children work to complete the six missions, easily adapted for different learning abilities and all introduced by fabulous videos from the Space Shed, which really set the scene for an exciting learning buzz in your classroom.

www.astrosciencechallenge.com

A creative mathematical project for your Space Week could be **'Build the ISS'**. With just a few materials, building a paper model of the ISS can become a class project that will really help to develop children's understanding of shape, measurement, 3D nets and scale. This NASA resource contains a brief overview of the ISS, its parts, the science that occurs on board, instructions and extension fact sheets.

www.stem.org.uk/elibrary/resource/35543



International Space Station © NASA

Key Stage 2

Booklist

Books are a great resource for your Space Week. Whether it is setting up a special space book display in the school library, using a feature text to inspire learning in the classroom or buying a class set of a space-themed book that different classes can take home on a rota to enjoy with their families.

Books can be used to inspire creative writing and letter writing as well as more formal, factual reports. This collection of space-themed books is age appropriate for working with upper primary children.

'George's Secret Key to the Universe' – Lucy and Stephen Hawking

Part of a series written by Professor Stephen Hawking and his daughter Lucy, this fast-paced adventure follows a boy called George as he discovers a portal to outer space inside his neighbour's super-intelligent computer called Cosmos. As you might expect in a book by Stephen Hawking, the narrative is filled with scientifically accurate facts and figures about space. A fantastic blend of adventure and space facts.

'Cosmic' – Frank Cottrell Boy

'Cosmic' tells the story of Liam, an incredibly tall 12-year-old who attempts to pass as an adult in order to accompany his friend Florida on a trip to space that she won in a competition. A very exciting adventure with plenty of comedy. 'Cosmic' is a really useful text to link to learning on astronaut training and living and working in space.

'The Jamie Drake Equation' – Christopher Edge

A wonderful story about a boy called Jamie whose father is an astronaut. While his father is on a mission aboard the International Space Station, Jamie is left behind to get on with life down on planet Earth. One day Jamie stumbles across clues to alien life forms which leads to a great adventure. A modern story packed with real space science in a way that is accessible to children.

'Curiosity: The Story of a Mars Rover' – Markus Motum

A stunning picture book that explores the story of Curiosity, the robotic space rover sent by NASA to find out about life on Mars. The story is told from the point of view of the rover and is bursting with facts and stylised illustrations. This text would really complement the wealth of resources linked to 'Missions to Mars' in the ESERO-UK eLibrary.

'A Galaxy of Her Own: Amazing Stories of Women in Space' – Libby Jackson

An excellent book that takes a historical approach to exploring the roles that women have played in the development of space science. Informative, interesting and most of all, inspirational. Lots of lessons for children in how to aspire to succeed and a phenomenal set of role models for young scientists.

Key Stage 2

'Hidden Figures: The True Story of Four Black Women and the Space Race' – Simon Bartram

This picture book is the story of four figures who contributed to some major milestones in the American space race: Dorothy Vaughan, Mary Jackson, Katherine Johnson and Christine Darden. Each woman overcame huge obstacles during a time when being black and female imposed major limitations on what people were allowed to do. This is a beautifully illustrated account of inspiring real-life stories and it really demonstrates the value of mathematics in the real world.

'The Usborne Official Astronaut's Handbook' – Louie Stowell

A funny and fascinating how-to guide for budding astronauts, providing a crash course on what it takes to travel into space. With a personal message by the British European Space Agency astronaut, Tim Peake, who spent six months on the International Space Station in 2016, and exclusive insights from the UK Space Agency and ESA who have provided expert advice on this book. A fantastic non-fiction text to support research about living and working in space.

> MFL/Citizenship/PSHE

Astronauts that work on the International Space Station come from all over the world. Children could research where the current crew come from and then learn some useful phrases from each of the languages spoken by the crew such as:

- Hello/goodbye
- Count down 10-9-8-7-6-5-4-3-2-1
- Blast off
- To infinity and beyond
- What is for dinner?

You could give each table in the classroom a nationality and ask them to use Google Translate to create a useful phrase book for their fellow astronauts. The children can then teach each other the new language they have learnt.

Space exploration and the search for extra-terrestrial life are wonderful subjects to discuss with children from a citizenship point of view. Questions such as: What does it mean to be a citizen of Earth? Should we inhabit the Moon or Mars? What would the consequences of finding life on another planet be? If you could communicate with life on another planet, what would you say?

Key Stage 2

> Geography

EO Detective is a schools' project created by the National Centre for Earth Observation. Their website is packed with engaging classroom activities to introduce children to Earth observation using satellite data and astronaut photographs.

There are fantastic space-themed lessons that will support learning in geography including:

- Colour in the Earth with Tim Peake
- From the ground and from the sky
- Viva Las Vegas!
- Watching a glacier



There are also some downloadable card games to engage children in Earth observation and a collection of career profiles so that children can learn about the wide range of careers and skills linked to Earth observation.

Visit their website to download these free resources: eodetective.wordpress.com

> History

The space race and the history of the Apollo missions is a fantastic historical theme for Space Week with so many great resources and video footage to bring lessons to life. Some particularly useful resources to support research about the Apollo missions in the classroom include:

The Apollo Program

A comprehensive website from NASA with details about all of the Apollo missions and links to genuine NASA reports. There is a fantastic gallery of images and other useful pages of the NASA website.

spaceflight.nasa.gov/history/apollo/

Footagevault

A selection of archived film clips from Footagevault looking at historic space footage. Film clips available include: 'Saturn V rocket lift-off', 'The hammer and the feather on the Moon', 'Astronauts leaping on the Moon' and more. Footagevault has kindly provided clips which can be used with no charge.

www.stem.org.uk/resources/collection/2974/footagevault-space-video-clips

Key Stage 2

Walking on the Moon

An interactive multimedia experience all about the Apollo 11 mission. It includes an interactive timeline about the 'Race to Space', a detailed description of the spacecraft and crew and a thorough insight into what they did while visiting the Moon.

smithsonianeducation.org/idealabs/walking_on_the_moon/index.html

Classes that learn about the space race in their Space Week may also enjoy relevant movies that link to this learning. Younger children might enjoy the animated film, 'Fly me to the Moon', the story of Nat the fly who convinces two of his friends to stow away on Apollo 11, whereas older children would get a great deal out of watching 'Apollo 13' starring Tom Hanks.

> Music

There are many ways to link space to music lessons with KS2 classes. Whether it is listening to 'The Planets, Op. 32' by the English composer Gustav Holst, or the huge spectrum of popular music inspired by the space theme or even singing popular tunes with new space-inspired lyrics. There is a super collection of **Primary Space Activities** on the ESERO-UK eLibrary that includes a comprehensive list of songs to listen to as well as a collection of sing-a-long space songs and some examples of using singing to learn.

YouTube is packed with short videos of space songs that are great to use in the classroom, such as Canadian astronaut, Chris Hadfield, performing **Space Oddity** onboard the ISS and **Phases of the Moon** in a hip-hop style.

> Art

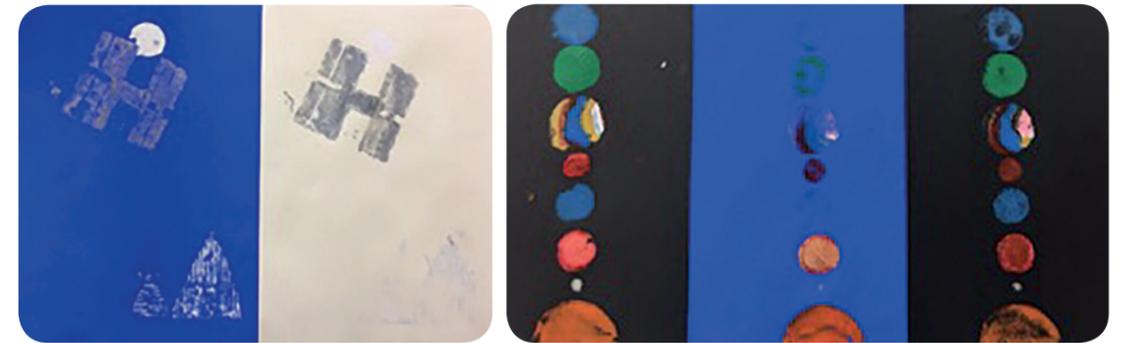
Space Printing

Space printing is a wonderful way for children to creatively express their ideas about space. Using junk materials, PVA glue and paint children can create stunning pieces of art. The image below shows a piece called 'Armstrong' created by a nine-year-old boy inspired by the Moon landings. On the right is the printing stamp that he created using scrap cardboard, fabric, string and a piece of hardboard. When complete, the printing stamp was coated in PVA glue to seal it and stop it absorbing paint. After being left to dry for 24 hours, the printing stamp could then be used repeatedly with different combinations of paint and paper for different effects as shown in the three samples to the left of the image.



Key Stage 2

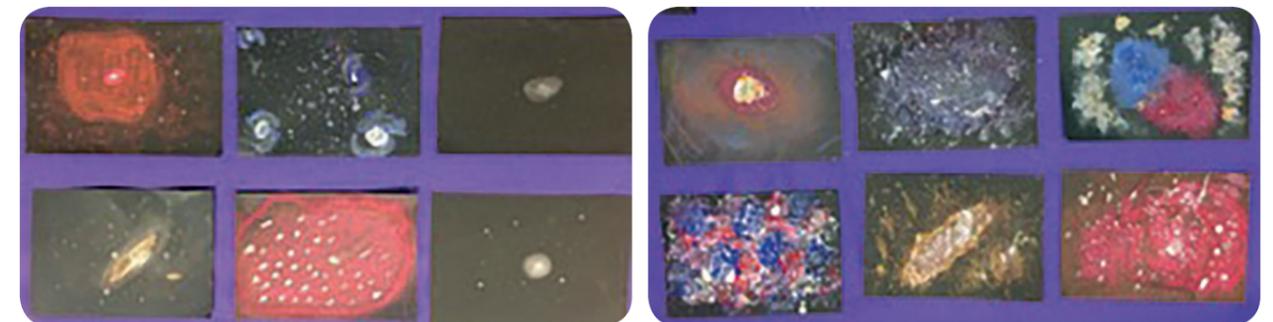
Here are some other examples of space printing. On the left is a piece inspired by the solar system and above is an image portraying the ISS flying above the pyramids inspired by Tim Peake's photographs from the ISS.



> Messier Objects

French astronomer, Charles Messier (1730–1817), originally a comet hunter, repeatedly came across strange objects in the night sky that were not comets and were certainly not individual stars or planets. Messier created an astronomical catalogue of 110 nebulae and star clusters. The Hubble Space Telescope has produced some stunning images of all 110 of these objects that are free to download from **NASA**. Children can research these images and then work in teams to create panels of the Messier catalogue to create a huge piece of art in the classroom.

The panels below show how children can recreate images of Messier objects using black paper, pastels, chalks, paint and, of course, a little sparkle.



Additional Links & Resources

Borrowing Moon and meteor samples

The Science & Technology Facilities Council (STFC) have a Lunar Rocks and Meteorites Loan Scheme that has been running since the mid 1980s. **Borrow the Moon** is straightforward to apply for and is free of charge, but it is a popular resource so you need to book well in advance. Visit the website to learn about the samples and additional teaching resources.

Schools in Wales can also borrow meteorite, Moon, Earth and Mars samples from Amgueddfa Cymru – National Museum of Wales Outreach Collection. You can find out more about this scheme on the **Down2Earth** website.

education.down2earth.eu/content/down-earth

The Space to Earth Challenge

The Space to Earth Challenge is a great opportunity to get the whole school active by running, cycling, swimming or even space-hopping the 715km to space. Visit their website to find out how you can organise such an event in your school. Their website is also a great source of information for other space-themed activities in school.

www.spacetoeearthchallenge.org.uk

Online School Telescopes

The Space to Earth Challenge is a great opportunity to get the whole school active by running, cycling, swimming or even space-hopping the 715km to space. Visit their website to find out how you can organise such an event in your school. Their website is also a great source of information for other space-themed activities in school.

National Schools' Observatory (NSO): www.schoolsobservatory.org/register

The Faulkes Telescope: www.faulkes-telescope.com/

Bradford Robotic Telescope: www.telescope.org/

Taking it Further

Space Education Quality Mark

The Space Education Quality Mark (SEQM) is a free award scheme, designed to support schools who want to inspire and engage their pupils in science, technology, engineering and mathematics (STEM) subjects. Schools taking part in the Mark will receive a box of resources, webinars, support for enrichment opportunities, face-to-face and online CPD, and the opportunity to engage with competitions and challenges. The SEQM is self-assessed. After applying, you will be sent a self-assessment grid which looks at using space as a context, both inside and outside of the classroom. In putting together your own, whole-school Space Week you will have already met a large proportion of the criteria for the Bronze Award.

To find out more about SEQM and sign up visit:

www.stem.org.uk/esero/space-education-quality-mark

Space Camps

Space Camps are sustainable residential learning experiences that take place in primary schools and are organised and run by teachers and teaching assistants from that school. A Space Camp is a low-cost unique learning experience that could be made available to all year groups in a school or just one.

Space Camps usually take place over two days and can be run with groups of children from Year 1 to Year 6. Normally a camp will be run for a whole class of 30 children and the children will participate in a range of science and creative workshops linked to many areas of the curriculum. Many of the schools who have set up Space Camp programmes have developed links with local universities and space industry businesses so that children get to meet a range of people who work in this area and find out about their work. Children will camp in school overnight, either in the school hall or in the grounds, allowing the opportunity for stargazing.

To find out about how you could set up Space Camps in your school, visit:

www.spacecampuk.com



Speakers/STEM Ambassadors/Workshops

Local STEM Ambassador Hubs

www.stem.org.uk/stem-ambassadors/local-stem-ambassador-hubs

Detailed list of astronomers available to give talks in schools from the Royal Astronomical Society:

www.ras.org.uk/education-and-careers/for-schools-and-teachers/1834-list-of-school-speakers

National Space Academy Masterclasses

nationalspaceacademy.org/programmes-for-teachers/masterclasses-for-students

CPD Opportunities

ESERO-UK – Space context CPD courses

www.stem.org.uk/esero/cpd

ESA summer and autumn workshops – annual residential CPD

www.esa.int/Education/Teachers_Corner/Apply_to_ESA_s_teacher_workshops

ESA robotics and automation workshops

www.esa.int/Education/Teachers_Corner/Current_opportunities

ESA Galileo Teacher Training Program – Annual residential training program

www.space-awareness.org/en/news/space-education-international-workshop/

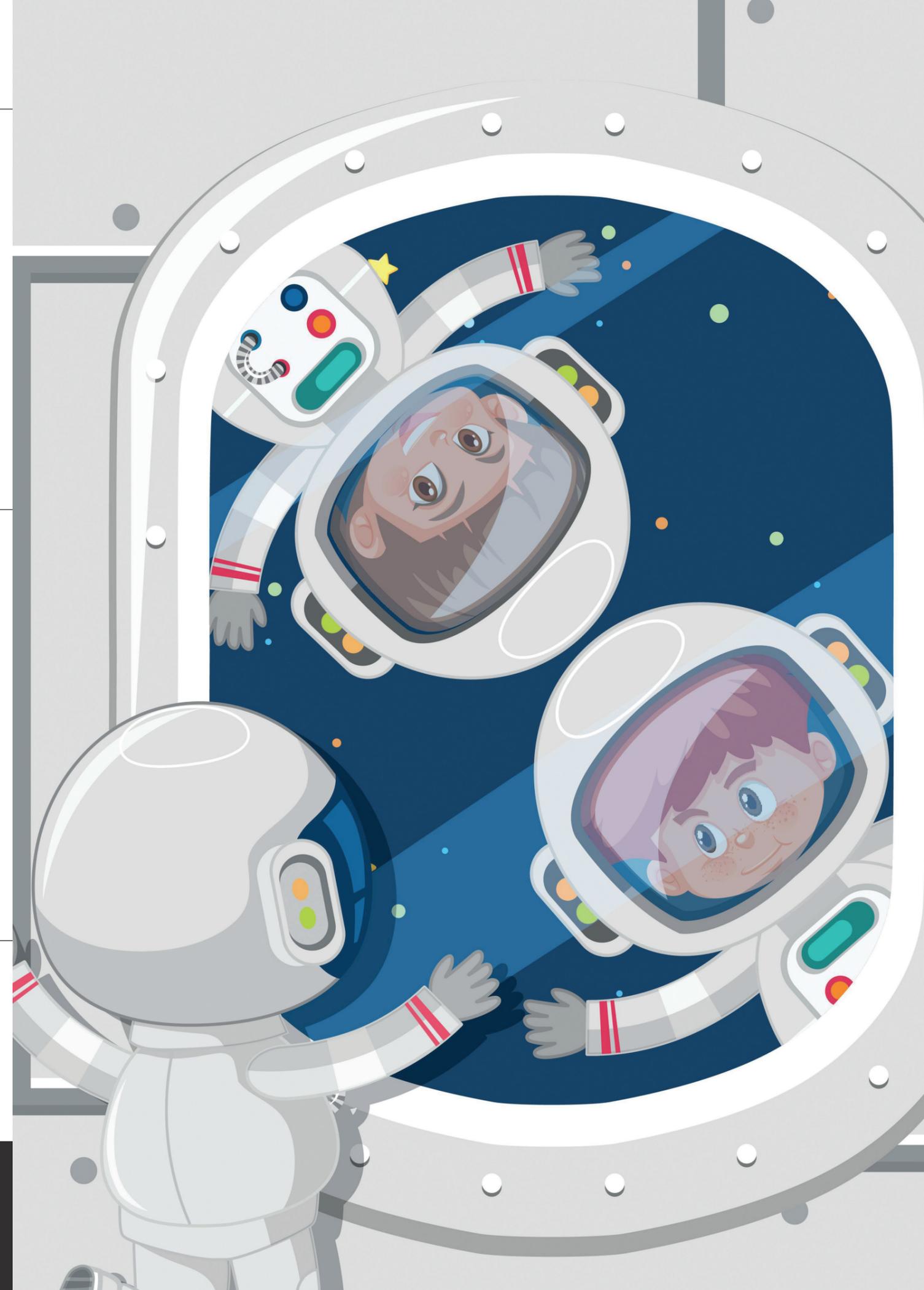
Funding Opportunities

Let Teachers SHINE – Grants for innovative projects in maths, science and English

www.shinetrust.org.uk/what-we-do/teacher-led-innovation/apply/

Science and Technology Facilities Council – Public Engagement Grants

www.stfc.ac.uk/public-engagement/public-engagement-grants/



Contacts for Astronomy Societies across the UK

There are many amateur astronomy societies across the UK. Perhaps you have a local one to your school who would be interested in helping to set up a family stargazing evening?

The Bristol Astronomical Society www.bristolastro.org.uk	Manchester Astronomical Society www.manastro.org
Bedfordshire Astronomical Society bedsastro.org.uk	Basingstoke Astronomical Society www.basingstokeas.org.uk
The Herschel Astronomical Society www.herschel-astrosoc.co.uk	Herefordshire Astronomical Society sites.google.com/site/hsastro/home
The Reading Astronomical Society www.readingastro.org.uk	Hertford Astronomy Group www.skiesunlimited.co.uk
The Aylesbury Astronomical Society www.aylesbury-astronomy.org.uk	Mid Kent Astronomical Society www.midkentastro.org.uk
Peterborough Astronomical Society www.peterborough-as.co.uk	Blackpool & District Astronomical Society www.blackpoolastronomy.org.uk
Chester Astronomical Society www.chesteras.blogspot.com	Leicester Astronomical Society www.leicesterastronomicalsociety.co.uk
Cornwall Astronomy Society www.cornwallas.org.uk	Lincoln Astronomical Society www.lincolnastronomy.org
Cockermouth Astronomical Society www.cockermouthastronomy.co.uk	Baker Street Irregular Astronomers www.bakerstreetastro.org
Derby and District Astronomical Society www.derbyastronomy.org	Liverpool Astronomical Society www.liverpoolas.org
Torbay Astronomical Society www.torbayastro.org.uk	North Norfolk Astronomy Society nnas.org
Wessex Astronomical Club www.wessex-astro.org.uk	York Astronomical Society yorkastro.org.uk
East Riding Astronomy Club www.brough-astronomy.webs.com	Nene Valley Astronomical Society neneastro.org.uk
East Sussex Astronomical Society www.EastSussexAS.org.uk	Kielder Observatory kielderobservatory.org
North Essex Astronomical Society www.northessexastro.co.uk	Nottingham Astronomical Society nottinghamastro.org.uk

Contacts for Astronomy Societies across the UK

Cotswold Astronomical Society www.cotswoldas.org.uk	Abingdon Astronomical Society www.abingdonastro.org.uk
Shropshire Astronomical Society www.shropshire-astro.uk	Redditch Astronomical Society www.redditchastro.org.uk
Bath Astronomers bathastronomers.org.uk	Isle of Wight Astronomical Society www.wightastronomy.org
William Herschel Society www.williamherchel.org.uk	Abergavenny Astronomy Society abergavennyas.org.uk
Doncaster Astronomical Society www.donastro.org.uk	Usk Astronomical Society www.uskastronomicalsociety.org.uk
Sheffield Astronomical Society www.sheffieldastro.org.uk	Gwynedd Astronomy Society www.gwyneddastronomysociety.co.uk
North Staffordshire Astronomical Society www.northstaffsas.co.uk	Preseli Astronomy Group preseliastronomygroup.org.uk
Orwell Astronomical Society www.oasi.org.uk	Cardiff Astronomical Society www.cardiff-astronomical-society.co.uk
Guilford Astronomical Society www.guilfordas.org	Swansea Astronomical Society www.swanastro.org.uk
Rugby and District Astronomical Society www.rugbyastro.org.uk	Astronomical Society of Edinburgh www.astronomyedinburgh.org
Birmingham Astronomical Society www.birmingham-astronomy.co.uk	Astronomical Society of Glasgow www.theasg.org.uk
Coventry and Warwickshire Astronomical Society www.covastro.org.uk	Aberdeen Astronomical Society www.aberdeenastro.org.uk
Walsall Astronomical Society www.walsallastronomy.co.uk	Highlands Astronomical Society www.spacegazer.com
Horsham Astronomy Group www.horshamastronomy.co.uk	Irish Astronomical Association irishastro.org.uk
West Yorkshire Astronomical Society www.wyas.org.uk	Northern Ireland Amateur Astronomy Society www.eaas.co.uk/cms/index.php
Swindon Stargazers www.swindonstargazers.com	

Planning a Field Trip – Places to Visit

Natural History Museum , London www.nhm.ac.uk/schools.html	Stonehenge www.english-heritage.org.uk/visit/places/stonehenge
Science Museum , London www.sciencemuseum.org.uk/learning	The Royal Observatory , Edinburgh www.roe.ac.uk
National Space Centre , Leicester spacecentre.co.uk	The Norman Lockyer Observatory , Sidmouth, Devon normanlockyer.com
Jodrell Bank , Macclesfield www.jodrellbank.net	The Astronomy Centre , Todmorden www.astronomycentre.org.uk
Greenwich Observatory www.rmg.co.uk/royal-observatory	The Observatory Science Centre , Hailsham, East Sussex www.the-observatory.org
Armagh Planetarium www.armaghplanet.com	The Winchester Science Centre www.winchestersciencecentre.org
The Spaceguard Centre , Powys spaceguardcentre.com	We The Curious , Bristol www.wethecurious.org
Thinktank , Birmingham www.birminghammuseums.org.uk/thinktank	Dynamic Earth , Edinburgh www.dynamicearth.co.uk
Glasgow Science Centre , Glasgow www.glasgowsciencecentre.org	University of York Astrocampus , York www.astrocampus.org.uk
Spaceport , Wirral www.spaceport.org.uk/Pages/default.aspx	UCL Observatory , London www.ucl.ac.uk/schools
Museum of the History of Science , Oxford www.mhs.ox.ac.uk	The Bayfordbury Observatory , Hertford www.herts.ac.uk/bayfordbury/bayfordbury-observatory
Woolsthorpe Manor (home of Isaac Newton) , Newark www.nationaltrust.org.uk/woolsthorpe-manor	Keele Observatory www.keele.ac.uk/observatory
The Herschel Museum of Astronomy , Bath herschelmuseum.org.uk	



Planning Grid

Assemblies		Monday	Tuesday	Wednesday	Thursday	Friday
		Launch Assembly	Year 6 Assembly	Space STEM Assembly	Year 4 Assembly	Celebration Assembly
Morning Session	EYFS					
	Y1					
	Y2					
	Y3					
	Y4					
	Y5					
	Y6					
Lunchtime Activities		Mission X Astronaut Training (Year 3)				
Afternoon Session	EYFS					
	Y1					
	Y2					
	Y3					
	Y4					
	Y5					
	Y6					
Extra-Curricular Activities						



The UK Space Education Office

Using space to enrich Science, Technology, Engineering and Mathematics
(STEM) teaching and learning in the UK.

www.esero.org.uk