

## Year 5 Learning Challenge

# TO INFINITY AND BEYOND



Can we create a space-themed science fair so we can educate and inspire children from our Multi Academy Trust schools?



### Hooks or memorable experiences

- Astronaut fitness class
- Creating space themed art
- Rocket launch
- Visit to National Space Centre

### Public Product

*A space-themed virtual science event, created and made by all children in the year group, will be launched to demonstrate their learning.*

### Class texts- whole class reading, extracts, thematic books

- *An Astronaut's Guide to Earth...*
- *Hidden Figures: The True Story of Four Black Women and the Space Race*
- *The Sky is Above my Eyes*
- *A Galaxy of Her Own: Amazing Stories of Women in Space*
- *Ickabog*

### Cognitive skills / meta-learning – specific teaching examples to use in learning

- CAF- initial idea/ prior knowledge
- PMI- Evaluate subjects/ experiences
- APC- Discussion around alternative outcomes/possibilities
- Collaboration/ planning- learning challenge
- Making links – to help with combining learnt information and experiences in preparation for fair
- Planning – preparing for challenge in a refined manner

### Killer Questions- those asked to measure understanding of pupils at key milestone points during the term

- *If Neil Armstrong did not successfully walk on the moon, what impact would that have on space travel today?*
- *Which event in space history do you think has had the most impact and why?*
- *What would happen if there was no gravity on Earth?*
- *Why is it important to have a diverse range of people within a team?*

| Year Group |   | 5 | Term | Autumn   | Challenge pack | To Infinity and Beyond   |   |
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| SUBJECT    | Children will learn about/ will know WHAT? (Declarative knowledge)  |   |      | Children will know HOW To...? (Procedural knowledge)   |                | Prior learning (Schemata)  | Vocabulary  |
| History    | <p>Q: How has advancements in technology contributed towards space exploration?<br/> A: Computers mean communication improved, sharing information between scientists better, finding info (Google) etc.<br/> Q: Which key events led to the space race?<br/> A: Different wars, esp Cold War led towards quick advancements as all countries wanted to be better.<br/> Q: Who are the 'Hidden Figures' and what contribution did they make o the Space race?<br/> A. Mary W. Jackson, Katherine Johnson and Dorothy Vaughn were part of a group of very important women who helped NASA succeed in getting American astronauts into space. helped break barriers and open opportunities for African Americans and women in the field of engineering and technology.<br/> Q: Which important scientists and people have impacted human knowledge around space?<br/> A: Buzz Aldrin, Armstrong, Newton (gravity – forces), NASA, Galileo. American scientist Robert H. Goddard – invented first liquid-fueled rocket. Mae C Jemison (First female Black astronaut)</p> |   |      | <p>H3.1a Populate a timeline with key periods including those not studied in depth<br/> H3.1b Demonstrate knowledge of key events in times studied, sequencing these correctly<br/> H3.2a Use a variety of sources to check for accuracy when building a picture of the past<br/> H3.2e Investigate the cause and effect of certain events</p>   |                | <p>Reading maps.<br/> Ability to sequence oldest to newest in correct order.<br/> Ability to construct a timeline.<br/> Sequencing events across large periods of time and considering their importance.</p> | <p>Sequence<br/> Relevant/relevance<br/> Development</p>    |
| Geography  | <p>Q: What are lines of longitude and latitude?<br/> A: Lines that help us distinguish where we are positioned on our planet.<br/> Q: How does our position on Earth will influence different factors, in terms of weather and how long our days and nights are?<br/> A: Position of sun in relevance to weather and seasons, length of day and exposure to sunlight for longer/shorter periods of time.<br/> Q: Why are the equator and different hemispheres important?<br/> A: Temperature and exposure to sun, effects seasons and weather.<br/> Q: What are the importance of the Tropics of Cancer and Capricorn?<br/> Q: How can we use modern technology to view the Earth and understand locations in comparison to ourselves?<br/> A: Use Google Earth to look at size of countries, placement in comparison.</p>   |   |      | <p>G3.1c Explain the significance of latitude, longitude, Equator, Northern Hemisphere, Southern Hemisphere, the Tropics of Cancer and Capricorn, Arctic and Antarctic Circle, the Prime/Greenwich Meridian and times zones (including day and night)<br/> G3.4a Use maps, atlases, globes and digital/computer mapping to locate countries and describe features studied</p>  |                | <p>Where England is on a map.<br/> Understanding of using digital technology.<br/> General knowledge of weather differences</p>  | <p>Latitude<br/> Longitude<br/> Hemisphere<br/> Equator</p> |
| Art        | <p>Q: What are the similarities and differences between Van Gogh, Peter Thorpe and Sayed Haider Raza?<br/> A: They use different mediums to show the difference between their time periods.<br/> Van Gogh – Late 1800s small focus on archaic artist (Starry Night)<br/> Peter Thorpe – Modern 21<sup>st</sup> Century Children will explore his signature motifs and how well he combines colour and texture (drawing, painting, oil pastels and collage)<br/> Sayed Haider Raza – 21<sup>st</sup> Century Indian painter. Raza often used concentric circles and geometric patterns which referenced the Tantric ideologies of Hinduism and Buddhism.</p>   |   |      | <p>A3.1a Make thoughtful observations, compare ideas methods and approaches in their own and selected artists work.<br/> A3.1b Know about and draw inspiration from a range of artists or cultures to influence their own work.<br/> A3.2a Know about and use a range of tools and media to create drawings utilising line and shade with increasing control<br/> A3.5a Adapt work in response to personal and group critique, describing how they will develop it in future.<br/> A3.5b Describe techniques used, evaluating how they could be performed more effectively. (Shading with oil pastels and how to accurately depict a light source onto their drawings)</p> |                | <p>Knowing that artists are important in our society(KS1)<br/> Select id3eas from a studied artist/art form to use in our own work (KS1)<br/> Using a range of media to experiment with shade (KS1)</p>      | <p>Shading<br/> gradient<br/> Mixed media<br/> Collage</p>  |

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| <b>Design Technology</b>  | <p>Can you design and make a spacecraft that can land safely on the moon?</p> <p>In this challenge, children follow the engineering design process to: (1) design and build a shock-absorbing system out of paper, straws, and mini-marshmallows; (2) attach their shock absorber to a cardboard platform; and (3) improve their design based on testing results.</p>   | <p>D3.1a Generate my own purpose(s) for the product that I am designing, drawing ideas from different sources</p> <p>D3.1c Create a specification for my design, refining my plans through the process</p> <p>D3.2a Use technical knowledge of joining materials (fabric, wood) to complete a task</p> <p>D3.4b Evaluate my production against the original idea, purpose and alterations needed</p> <p>D3.4c Explain why plans may have had to be refined in the process</p>  | <p>Designs that are fit for purpose</p> <p>Producing a labelled plan</p> <p>Selecting appropriate tools</p> <p>Cut and measure materials</p> <p>Evaluate at the end of the making process</p>  | <p>Descends</p> <p>Probe</p> <p>Engineering Forces</p> <p>Shock absorbers</p>                        |
| <b>ICT and Computing (include Apps and digital pencil case)</b> | <p>Q: How can we use technology to create a space-themed resource for our science event?</p> <p>A: We can use Purple Mash’s 3D Tool to create games that are space-themed.</p> <p>Q: How do we debug a program and use different technological sources?</p> <p>A: We can use iPads, computers and other tools to help us develop our knowledge. We can use Purple Mash to debug our games as they develop.</p> <p>Q Can we code a bot to follow a specific set of instructions.</p> <p>A: We can code Spheros to follow our commands.</p>   | <p>C3.1a Understand computer networks including the internet; how they can provide multiple services.</p> <p>C3.1b Understand the opportunities for communication and collaboration</p> <p>C3.1c Combine a photos and video to create a multi-media presentation/animation/book</p> <p>C3.2a Select, use and combine a variety of software that accomplish given goals</p> <p>C3.2c Design and create systems</p> <p>C3.3a Design, write programs that accomplish specific goals</p> <p>C3.3f Use logical reasoning to debug</p> <p>C3.4a Use technology safely, respectfully and responsibly</p> <p>C3.4c Use search technologies effectively, appreciate how results are selected and ranked</p> <p>C3.4d Be discerning in evaluating digital content</p>  | <p>How to use different technology – difference between PC and iPad</p> <p>Use of Purple Mash</p>  | <p>Debug Program</p>   |
| <b>PSHE</b>   | <p>Q: Which figures were important in the development of space travel and exploration?</p> <p>A: Understanding of different key figures from all races and backgrounds contributed, and continue to contribute, towards this.</p> <p>Q: Why are role models and great citizens?</p> <p>A: They are able to work well with others to create magnificent achievements, which allows our society to progress.</p>  | <p>I can discuss the importance of role models in the community</p> <p>I understand that it is important to behave responsibly and how the consequences of people’s behaviours can affect others</p> <p>I can identify organisations in communities and the wider world that help people with their rights</p>   | <p>Consider the different pathways that people might take in life</p> <p>Understanding of good values and behaviours</p> <p>Idea of ‘personal strengths’ and ‘equal rights’ and what these mean</p>  | <p>Role model</p> <p>Race</p> <p>Equity</p> <p>Responsibility</p> <p>Citizen</p> <p>Human Rights</p> |
| <b>Relationships to core subjects (Maths, English, Science)</b> | <p><u>English</u></p> <p>Setting Description/Transmission log/Non-Chronological Report</p> <p><u>Maths</u></p> <p>Reading and interpreting graphs, Place value, Measurement</p> <p><u>Science</u> – Space and Forces</p> <p>Q: Why are forces an important factor on the universe and our everyday lives?</p> <p>A: Important because gravity keeps us down, different resistances are balanced well to work against gravity. Magnetic forces allow this to happen.</p> <p>Q: How can mass influence forces?</p> <p>A: The larger the mass the stronger the gravitational pull.</p> <p>Q: What is our solar system composed of, what is the order of planets from the sun and why is this important for temperature, light, length of days/years?</p> <p>A: Of matter (lots of different elements). My Very Easy Method Just Speeds Up Naming Planets (Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune, Pluto (not a planet). Distance from sun dictates temperature due to exposure to sun. The same is true for light and length of days/years.</p> | <p>Maths – Deeper knowledge of size, especially when considering distances between planets and/or the size of planets etc.</p> <p>Science- S3.2e Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object.</p> <p>S3.2f Explain with scientific understanding, the effects of air resistance, water resistance and friction, that act between moving surfaces.</p> <p>S3.2g Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.</p> <p>S3.2h Describe the movement of the Earth, and other planets, relative to the Sun in the solar system.</p> <p>S3.2i Describe the movement of the Moon relative to the Earth using scientific terms.</p> <p>S3.2j Describe the Sun, Earth and Moon as approximately spherical bodies of different sizes and mass.</p> | <p>Expanded noun phrases, adverbials, subheadings, bullet points, captions and paragraphs.</p> <p>Place value knowledge, understanding of length and what data can be interpreted for a graph.</p> <p>3D shape - Spheres</p> <p>Seasons – what they are and how they differ</p> <p>Knowledge of forces</p> | <p>Spherical body</p> <p>Gravity</p> <p>Mass</p> <p>Rotation</p> <p>Axis</p> <p>Orbit</p>            |

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|  | <p>Q: Why are spheres so apparent in our solar system and how are gravity and mass factors for this?</p> <p>A: Gravity works through magnetic waves, which pulls in mass to a centre. This creates a sphere.</p> | <p>S3.2k Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.</p> |  |  |
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