

# Mary Jackson Challenge



**Mathematician and first, black, female engineer at NASA!**

A ground breaker and change maker; Mary was determined to be successful and help those around her too. Let's find out more in Mary's Challenge!

For even more programme ideas check out our 'Mary Jackson' board over on [www.Pinterest.com/PawprintFamily](https://www.Pinterest.com/PawprintFamily)

**#AdventureForAll**  
[www.PawprintFamily.com](http://www.PawprintFamily.com)

# Meet the FAMILY

Hi there! We're Charlotte & Jamie, the husband and wife team behind the Pawprint Family and we believe in #AdventureForAll.

It's our mission to help leaders, teachers and parents save time by providing ideas and opportunities to help them deliver everyday adventure and skills for life. We do this through our family of brands; find out more below and head to the website for your next adventure!



## PAWPRINT BADGES

Pawprint Badges provides thousands of free activity ideas and resources to help leaders, teachers and parents deliver fun and adventure.

Every activity helps you share skills for life and is linked to one of our pawesome embroidered badges. Build your collection and celebrate adventures, new skills and knowledge gained.

## PAWPRINT TRAILS

Pawprint Trails are treasure-hunt style walks around locations in the UK. Solve puzzles, track down the answers and explore everything our great country has to offer.

From historical sights to popular culture discover something new or rediscover a love for where you live then collect the badge to remember your adventures!

Whether you're looking for the perfect addition to your next family holiday or a few hours of fun with friends; each trail can be completed in a few hours or extended with our activity suggestions in to a weekend or a week's worth of fun!

## PAWPRINT TALES

Pawprint Tales are fully illustrated stories that can be enjoyed by the whole family. Join Alfie (our fox-red Labrador) on his adventures around the UK – solving puzzles, turning detective and making new friends. With twists and turns, every tale is an opportunity to discover new places, people and history without needing to leave the comfort of your own home.

Enjoy Pawprint Tales alongside your Pawprint Trails or as a standalone adventure!

## PAWPRINT TRUST

Every brand in the Pawprint Family supports the Pawprint Trust with a percentage of profits from every sale providing grants to young people. We're passionate about enabling young people to access life changing adventures.

Share your adventures and join us over on our social channels for even more adventures and a nosy behind the scenes at Pawprint HQ!



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@pawprint\_family

# PAWPRINT BADGES

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**[www.pawprintfamily.com/terms-conditions](http://www.pawprintfamily.com/terms-conditions)**



# Craft

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Take on your own engineering challenge and build a structure to support an egg. Mary Jackson became the first, black, female engineer at NASA in 1958.



In 1970s Mary helped a local youth club build a wind tunnel for testing aeroplanes, make one of your own. Check out our Pinterest for some ideas.



Make paper aeroplanes and fly them, then adapt and improve them.

## Why?

Mary's work as an engineer at NASA involved studying and understanding the behaviour of air around aeroplanes. Paper aeroplanes can help us understand this too and how changing the shape of the aeroplane can affect the air movement and speed.



Build a parachute for an egg. Mary had a dual degree in Maths and Physics; making and flying your parachute can help you understand air movement and physics.



Create a paper helicopter and investigate its movement through the air.



Make your own kite and fly it; what materials do you need for a successful kite? Will paper work? How about netting? Test different materials and compare.



Build a rocket and launch it in a race to space!

## Why?

Mary's work at NASA was depicted in the 2016 film, *Hidden Figures* based on the book of the same name by Margot Lee Shetterly. The film shows the work of three African American female mathematicians who worked at NASA during the Space Race.



Design your own computer programme or complete a programming activity.



Float your own paper plate hover craft made from a paper plate and balloon.



On 26<sup>th</sup> February 2021 the NASA HQ in Washington was renamed after Mary Jackson. Make your own name sign for your home/bedroom.



Make balloon rockets and race them along lengths of string; check out our Pinterest board for ideas.



Complete the egg drop activity and test your engineering skills. Can you design and build a vessel/contraption to hold and protect an egg from breaking when it's dropped from a height?



# Food

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Bake a smith island cake; the state dessert of Maryland where Mary was a maths teacher in Calvert County.



For more than 30 years Mary was a Girl Scout leader. Find out about Girl Scout cookies and then bake your own biscuits and cookies. Why not hold a bake sale and raise money for your group or a charity of your choice?



Make space ice cream.

## What?

Also known as instant ice cream or ice cream in a bag, which is probably how it got its name as space ice cream...although we're not sure you'd want to have a go at making this in a zero-gravity setting!

You will need: 300ml milk, 1 tbsp caster sugar, 1/4 tsp vanilla extract, 1kg ice, 6 tbsp salt, 2 large zip lock bags, 2 small zip lock bags. Pour your milk, sugar and vanilla extract in to one of the small zip lock bags and seal well. Place inside the second small zip lock bag and seal. Add your ice and salt to your large zip lock bag and place your small bags inside. Bag the whole lot securely in the second large zip lock bag and shake for approx. 10 minutes.



Build a structure from biscuits or crackers to withstand the force of a fan or hairdryer. Think about air flow and aerodynamics.



Engineer a Pringles® ring. What else can you construct using crisps?



It's an old favourite but a great engineering challenge nonetheless...build a tower using spaghetti and marshmallows.



Make biscuits and gravy.

## What?

Mary Jackson was born in Hampton, Virginia where biscuits and gravy is a favourite dish. It's not like having a few rich teas with a jug of gravy though! The buttermilk biscuits are closer to a scone and the gravy is made with fried sausage. Have a go and see if it will become a favourite for you.



Smoked country ham is the centre of many festive and holiday tables in Virginia. Find out how meat is smoked, cured and preserved.



Bake your own space based biscuits; from rockets to stars and the whole solar system of planets, there's plenty to go at!



Recycle leftover roast meat and make Brunswick Stew, another Southern comfort food and Virginia favourite.



# Games

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Compete to see how far you can fly a paper aeroplane or a rocket you have built. Count the making as your Craft challenge.



Mary faced segregation and inequality at NASA because of the colour of her skin. Black employees had to use separate bathrooms and dining facilities. Play a game such as draughts or noughts and crosses but include an inequality, i.e. one player gets twice as many turns as the other.



Play some Countdown style maths games.

## Why?

Mary first began work at the National Advisory Committee for Aeronautics (NACA, the precursory to NASA) in 1951 as a computer; meaning she worked in a team of women who did calculations much like computers do today. She also worked as a maths teacher after graduating with a degree in Maths and Physics.



Mary earned a Bachelors Degree in Maths and Physical Science from the Hampton Institute (now Hampton University) in 1942. Play a movement game such as Twister or hop scotch.



Play a game of Simon Says and move in different ways.



Have fun with some parachute games and watch the parachute move through the air. Can you trap the air, how does it make the fabric move?



Go on a maths scavenger hunt.

## How?

You can do this however you like but here's a couple of suggestions to get you started: Hide numbers around your space and then hunt to find the answers to a given sum or equation. Hide sums around the space and then hunt to find the matching question and answer or to find a sum equal to the one given.



Have your own Space Race with an obstacle course around moon rocks, space debris/junk and dodging meteors. You could make your circuit circular or elliptical and compete to see how many orbits you can complete in a set amount of time.



Play Frisbee golf or Frisbee noughts and crosses. See how Frisbee physics work.



Compete in a maths version of blockbuster; solve maths puzzles and work your way across the board to win. Can you make it horizontally/vertically across the board before your opponent?



# Other

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-  Watch the Hidden Figures film.
-  Read Hidden Figures by Margot Lee Shetterly.
-  Attend a Girl Scout meeting (Rainbows/Brownies/Guides/Rangers) or earn a badge. Mary was a troop leader for more than 30 years.
-  Give your time as a volunteer like Mary. In 1976 she was awarded Langley's Volunteer of the Year award.
-  Create your own biography or social profile for Mary using the information you have learnt during your adventures.
-  Complete your Astronaut Adventures badge and enjoy some more space themed fun.
-  Visit a space centre or if you're lucky enough to be able to, visit NASA.
-  The Langley Research Centre where Mary worked is the oldest of the NASA field centres and was a crucial part of the Space Race. Find out what the Space Race was and make a timeline of key dates.
-  Find out about the Emancipation Oak in Hampton, Virginia where Mary was born. Sit under a tree and read.
-  Write a CV or do something to help develop your employability skills. Following her work at NASA Mary worked as Langley's Federal Women's Program Manager helping other female mathematicians, engineers and scientists to get hired.
-  Publish your own writing by creating an article for your local paper or community newsletter. During her time at NACA/NASA Mary authored or co-authored 12 technical papers.
-  Discover the other black, female mathematicians whose stories were told in Hidden Figures.
-  In 2019, Jackson was posthumously awarded the Congressional Gold Medal; find out what this is and who else has been awarded it. Why not design a medal for someone inspirational to you?
-  During her early career Mary worked as a bookkeeper. Discover what this entails and have a go at keeping your own accounts or some family accounts for a few weeks.

## Adventure Complete?

**Reward your young adventurers with their Mary Jackson Challenge badge to mark their achievements!**  
Head to the website to bag yours, download certificates and discover even more adventures!



## Create a Keepsake!

Experienced **adventure**? Made **memories**? Then it's time to create a **keepsake**! Our Pawprint Family camp blankets are the perfect place to **sew your badges** and look back on them for years to come.



## Personalise it!

Got your camp blanket? Then it's time to make it yours! Our alphabet badges are **big, bright and bold**...the perfect addition to your camp blanket, hoodies, bags and more. What will you personalise first?



## Even More Rewards!

We're all about added value here at Pawprint Family. In addition to the 1000s of **free activity ideas** and resources you'll find **loyalty stickers** in every order and you can claim Children's University learning hours too!



Subscribe to the **Tribe News** for all the latest adventures direct to your inbox!

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