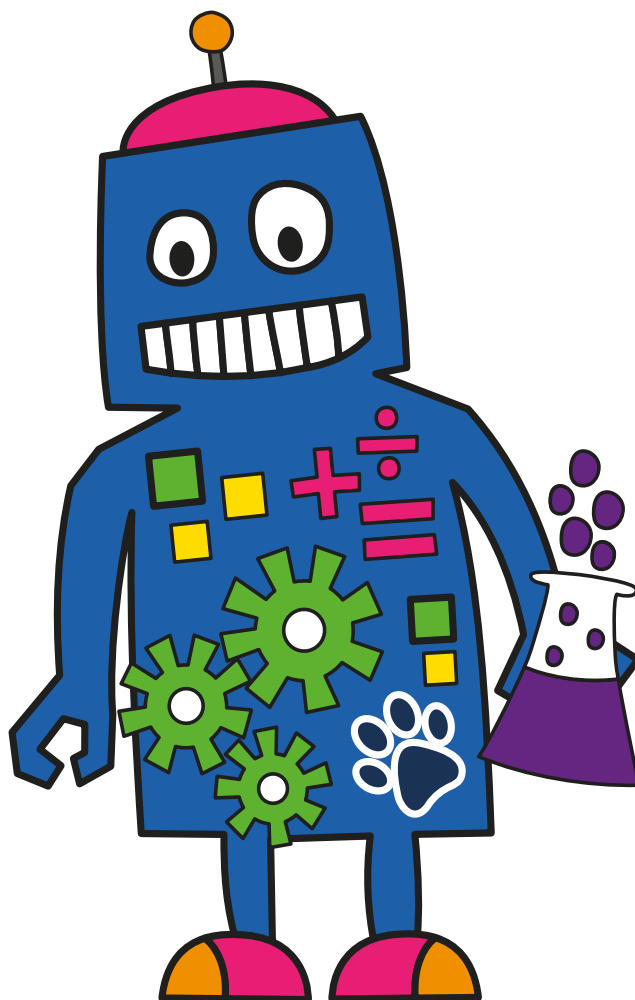


S.T.E.M Challenge



Blast off in to a world of Science, Technology, Engineering and Maths!

Ready for some foody experiements or some ground breaking builds? TJ-5 the robot is the winning design from Teddy Johnson; created as part of our 2019 Design Competition.

Proceeds from this badge go towards helping Scouts and Guides from across the UK take part in lots of adventures via The Pawprint Trust. Thank you for your support!

Suggested challenges for different age groups:

3-5 Years : Complete a minimum of 3 challenges from different sections.

5-7 Years : Complete 1 challenge from each of the 4 sections.

7-11 Years : Complete 1 challenge from each of the 4 sections + 1 more of your choice.

11-14 Years : Complete 1 challenge from each of the 4 sections + 2 more of your choice.

14-18 Years : Complete 1 challenge from each of the 4 sections + 3 more of your choice.

18+ Years : Award yourself a badge for assisting young people in achieving their challenges.

For even more programme ideas check out our 'STEM' board over on
www.Pinterest.com/PawprintBadges

Once completed head to the website to get your paws on your badges!

www.PawprintBadges.co.uk

Craft



- ⚙️ Create an umbrella to keep your toys dry. What materials are good to use and which aren't? Why is this?
- ⚙️ Discover colour mixing and create a colour spinner disk.

How?

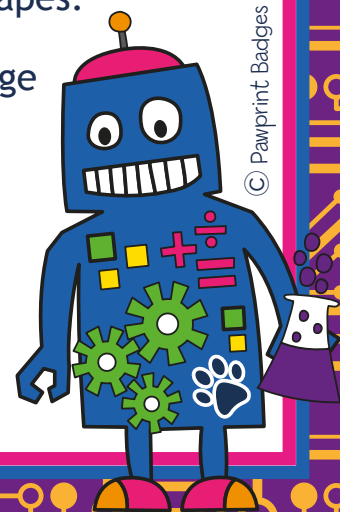
Cut a circle of card and divide it into thirds like cutting a pizza. Colour each third in 1 of 3 colours: red, yellow and blue. Push a skewer through the centre of your circle and secure on the back. Spin your disk like a spinning top and see the colour mixing magic.

- ⚙️ Design and make a maze using a paper plate and straws. Did you know there are only 10 basic types of maze?
- ⚙️ Build a robotic hand using paper, straws and string.
- ⚙️ Craft some jewellery from silver clay.

Did You Know?

The chemical symbol for silver is Ag coming from the Latin word *Argentum*. Silver is also one of the few words in the English language that is nearly impossible to rhyme.

- ⚙️ Candles burn at 1000°C; make your own candles using wax beads or sheet bees wax.
- ⚙️ Make paper chain decorations using only one sheet of paper. How long can you make your chain? Why not have a competition?
- ⚙️ Create your own peg board using wood and nails. Practice your DIY skills then use string to draw a picture or pattern by winding it around the string. What geometric shapes have you created?
- ⚙️ Potato print your own wrapping paper using geometric shapes.
- ⚙️ Have a go at pottery painting and watch the colours change before and after being fired in the kiln!
- ⚙️ Code your own drawing robot and make some art.
- ⚙️ Make a paper plate sundial.
- ⚙️ Mix your own slime!



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Food



- ⚙️ Create a solar oven and toast your own s'mores.
- ⚙️ Build a tower from spaghetti and marshmallows.

Why?

Though this may seem simple lots of lessons can be learnt from this old favourite. Working and communicating in teams can build resilience, communication, listening and teamwork skills whilst also discovering which shapes make the strongest structures. Afterwards you have a tasty marshmallowy reward too!

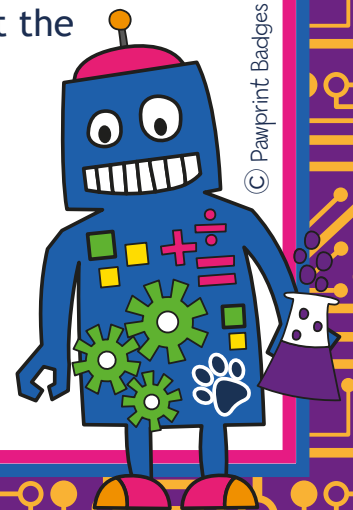
- ⚙️ Build a Pringles® ring...not sure what this is? Take an internet search and prepare to be amazed!! A true test of engineering ability.
- ⚙️ Create your own erupting lemons by slicing across the middle to expose the segments, fill the segments with washing up liquid and food colouring then sprinkle with bicarbonate of soda.
- ⚙️ Mix your own Fibonacci lemonade rainbow.

How?

The Fibonacci sequence is a sequence of numbers where each number is the sum of the two preceding it: 1, 1, 2, 3, 5, 8, 13, 21, 34...





To make a rainbow lemonade: fill a glass with ice and mix some simple syrup (1 cup of sugar to 1 cup of water). Mix each layer as follows: layer 1 - 1 tsp. lemon juice, layer 2 - 1 tsp. simple syrup, layer 3 - 1 tsp. lemon juice, 1 tsp. simple syrup, layer 4 - 1 tsp. lemon juice, 2 tsp. simple syrup, layer 5 - 2 tsp. lemon juice, 3 tsp. simple syrup, layer 6 - 3 tsp. lemon juice, 5 tsp. simple syrup, layer 7 - 5 tsp. lemon juice, 8 tsp. simple syrup. Add food colouring to each layer if desired.

- ⚙️ Make magic and make an eggshell disappear by leaving an egg in vinegar for 24 hours. Find out what's happened to the shell.
- ⚙️ Mix your own ice cream in a bag (for the recipe check out the Astronaut Adventures challenge pack).
- ⚙️ Investigate how and why bread rises and bake some.
- ⚙️ Create your own honeycomb and watch the reaction.
- ⚙️ Churn your own butter from cream.
- ⚙️ Pop your own popcorn.




Games

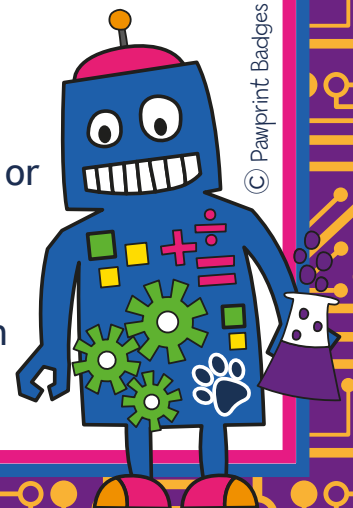


-  Race against the clock or another team to build a water slide or shoot to get water (or balls) from one place to another.
-  Have a go at rock stacking. How tall can you build your rock tower? There are world championships for this, take a look and see how others do it.
-  Create a rocket launcher and have a competition to see how far you can fly your rocket.
-  Fold your own paper plane. How far/fast can it travel?

Did You Know?

The record flight for a paper plane is 69.14 meters (226 feet 10 inches) and was set on 26th February 2012. The plane was constructed from a single sheet of uncut, A4 paper; designed by John M. Collins, flown by Joe Ayoob.

-  Build your own marble racers and race them with friends.
-  Pioneer your own cross bow or catapult. How far can your fire an object?
-  Play a competitive round (or two) of Countdown with numbers; using a series of smaller numbers to achieve a bigger number mathematically, using each number only once.
-  Have a game of darts and test your maths skills. Count up or count down whichever you like.
-  Play a game of Yahtzee or another dice game.
-  Set up your own domino chain reaction. How long can you make your chain? How many dominoes is that? Is there a perfect distance between the dominoes to get them to topple each other over.
-  Create your own card game using famous scientists, mathematicians, or engineers.
-  Practice strategy with games like battleship, mastermind or chess/draughts.
-  Test your skills with some match stick logic games, ie. use 9 matchsticks to make as many triangles as you can in 1 minute.



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Other

- Visit your local science museum.
- Grow your own salt crystals from salt water.
- Make your own compass and find North.
- Explore electricity by building circuits, wiring a plug or creating your own static charge.

Did You Know?

Lightening is a naturally occurring electrostatic discharge and strikes at speeds of up to 210,000 km/hour and reaches temperatures of up to 30,000°C.

- Create a water xylophone using glass bottles filled with different levels of water.
- How do you get an egg in a bottle? You will need: a hard boiled egg (peeled), wide mouth glass bottle, matches, paper.
- Take photos using a film camera and have a go at developing them yourself or experiment with light sensitive (sunography) paper.
- Galileo developed telescopes and discovered the moons of Jupiter; visit a planetarium or go stargazing.
- Make a cloud in a jar.
- Create a parachute for an egg.
- Find out about some famous scientists, engineers or mathematicians and share your findings in an interesting way.
- Discover how your favourite or most used gadget was invented. Sometimes things get invented by accident, other times they're invented out of necessity.
- Find and undertake a science experiment of your choice.
- Take part in a STEM competition to test your skills as part of a team.
- Share your adventures working towards your S.T.E.M.W Challenge badge to let others know what you've been up to. Tag us @PawprintBadges and #AdventureForAll

