

HOME LEARNING PACK

STEM CHALLENGES PART 2



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STEM CHALLENGES

The Marches Centre of Manufacturing and Technology is an employee led training centre.

Over 5 million pounds has been invested in setting up both facilities in Shrewsbury and Bridgnorth.

Marches centre trains people, giving them the skills needed to carry out roles within a range of companies linked to Manufacturing and Engineering. It is working towards addressing the skills gap across Engineering.

The training provider, In Comm, provides all training which is rated as an outstanding provider MCMT is a build on of the success at the Aldridge site.

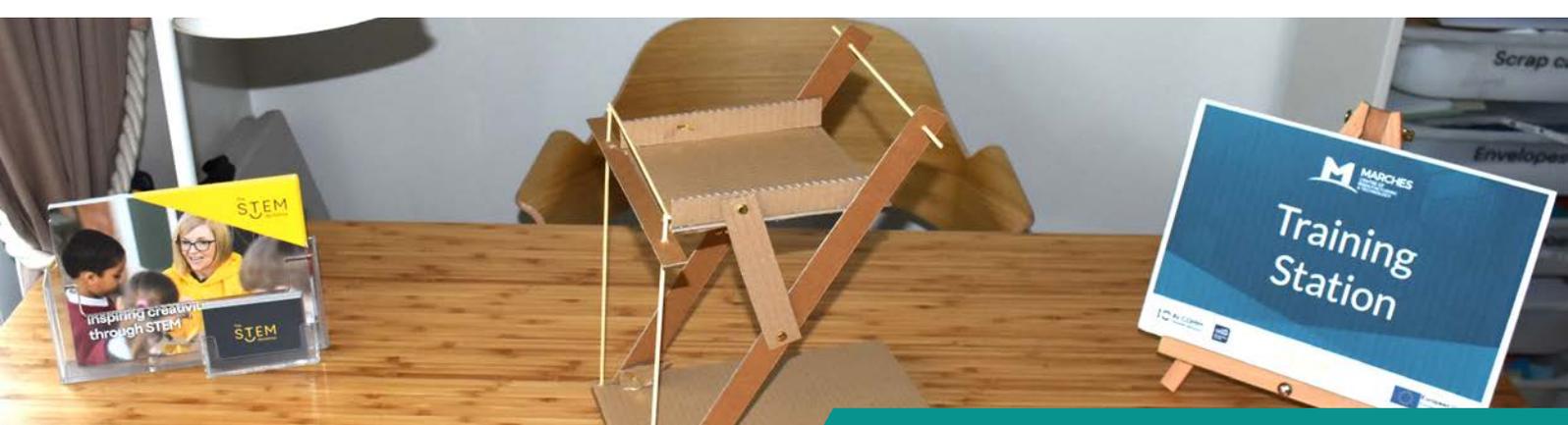
WE ARE CONTINUOUSLY SEEKING:

PROBLEM SOLVERS
INNOVATORS
MANUFACTURERS
ENGINEERS
LEADERS
OPERATIVES
SUPER HEROES

We have developed some challenges to support you on your journey in becoming a part of engineering A brighter future for yourselves.

Our employers are continuously looking for those that go above and beyond to demonstrate their skills and attributes, so we have provided some contexts in which you can begin to build your portfolio of skills.

You can select and have a go at one or more of the challenges, each has been designed to reflect the engineering sector.





CHALLENGE 4 MODERN TECHNOLOGY COMPUTER AIDED DESIGN

To design and innovate a new product using computer aided design to support in combating against the spread of viruses following on from the impact of COVID19

Shropshire 3D Print works to support education and businesses in providing them with the technology to allow them to innovate with the production of products and prototypes. Shropshire 3D print is based in Shropshire and supplies products nationally. COVID has seen an increase in companies needing this technology.

CHALLENGE

1. Explore the **problems** that have occurred following on from COVID19 and explore what **opportunities** and products could be developed to combat these.

2. Select a **problem or opportunity** to explore and **develop a range of ideas** as a solution
- Sketch - Model

Example: Device to aid opening doors to prevent user touching and potentially spreading the virus

3. Select and **prototype** an idea using **Computer Aided Design**

EXAMPLE

You could submit your proposed idea either as a **traditional model** or you could use **CAD**



Image source: noxnox on thingiverse- <https://www.thingiverse.com>

SUGGESTED SOFTWARE



CHALLENGE 5 DESIGN ENGINEERING MANUFACTURING

To design and prototype a solution to reduce capacity of recycled products, such as plastic bottles and cans, to help reduce the volume of waste

Using resources available in and around the home, you are to develop a prototype or series of prototypes for reducing the capacity of waste materials.

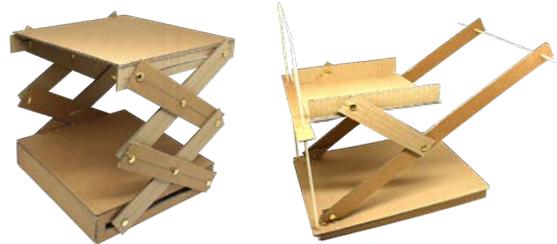
1. IDENTIFY WASTE PRODUCTS

Identify the range of waste that takes up too much volume



2. PROTOTYPE IDEAS

Explore ideas for condensing the waste

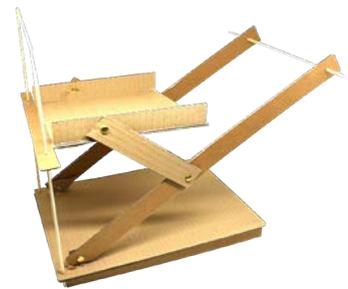


SUBMISSION

You could submit your proposed idea either as a **traditional model** or you could use **CAD**



Traditional model or CAD



CHALLENGE 6 METROLOGY MEASURE

Select a misused or broken product in and around the home, redesign or replicate a component to repair.

CHALLENGE

1. SOURCE A PRODUCT

Example products with broken or missing parts



2. GATHER DATA

You must gather all the data needed in order to replicate part or product

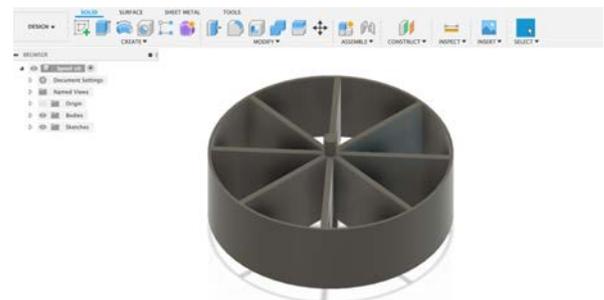
Data for tape dispenser



Internal diameter of tape = 77mm
 External diameter of tap = 100mm
 Internal radius of tape to find centre point = 38.5mm
 Width of the tape = 24mm
 Width of inner part of spool = 24mm
 Width of slot on dispenser = 5mm
 Distance across slots either side = 36mm

3. MAKE REPAIR

CAD drawing



SUBMISSION

You can carry out the repair using traditional manufacturing techniques or you can use CAD software in view of it being manufactured for you using 3D printing technology.

FOR MORE INFORMATION ON **APPRENTICESHIP ROUTES VISIT:**

IN-COMM.CO.UK

MCMT-BRIDGNORTH.CO.UK

FURTHER GUIDANCE AND SUPPORT MATERIALS

We have produced video tutorials to provide additional support for students accessing these challenges, these can be found on [YouTube](#) using the following link:

www.youtube.com/channel/UCxkm_I8OcR10vijKizKHbcg
or by searching [Marches Centre](#)

All challenges and associated resources can also be requested by contacting either
[Leanne Mee - leanneme@thstemworkshop.co.uk](mailto:leanneme@thstemworkshop.co.uk)
[Amy Farley - amyf@mcmt.co.uk](mailto:amyf@mcmt.co.uk)

CHALLENGE SUBMISSION

All challenge submissions to be sent in a readable format to either of the email addresses above, these will be judged by specialists from each of the companies.

Deadline for submission: Last day of every month

Winners announced: First week of every month

Winning entries will receive £25 amazon gift voucher

THE CHALLENGES HAVE BEEN SUPPORTED BY SOME OF OUR PARTNERS AND EMPLOYERS:

