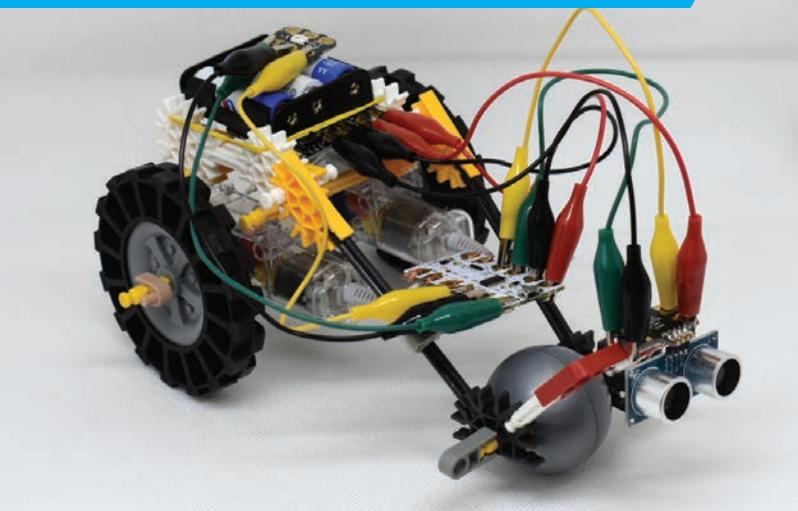
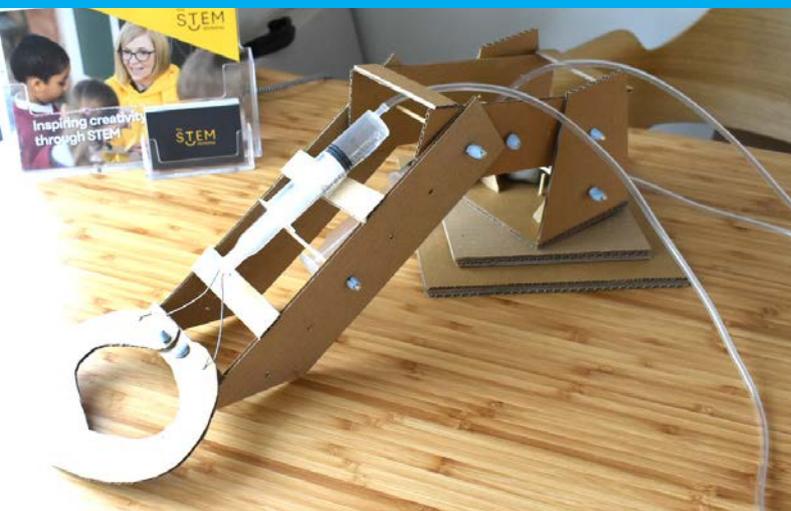


HOME LEARNING PACK

SECONDARY STEM CHALLENGES

PART 1



HOME LEARNING PACK

STEM CHALLENGES

Rated by Ofsted as 'Outstanding', In-Comm is now one of the UK's leading providers of training and business services, working across more than 10 sectors and with over 250 different companies. It has developed a simple, but effective approach to bridging the country's skills gap.

This focuses on building strong relationships with employers to ensure they get access to programmes that will deliver them the right type of learner, the right upskilling opportunities and the specialist assistance they need to improve quality or business systems.

Our three training Academies in Aldridge, Shrewsbury and Bridgnorth have received £4m of investment to create three cutting-edge facilities and we have a proven track record of attracting some of the most experienced and skilled trainers in industry.

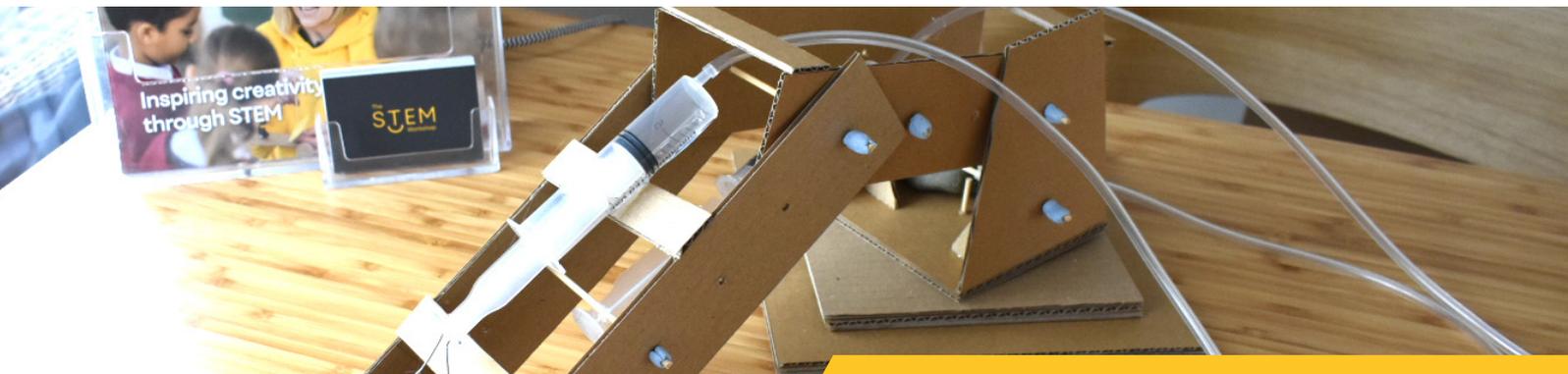
WE ARE CONTINUOUSLY SEEKING:

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 1 AUTOMOTIVE MODERN TECHNOLOGY

Develop an idea for using modern technology to improve safety and environmental impact supporting Gestamp in expanding its product range.

With presence in more than 23 countries, Gestamp is an international group dedicated to the design, development and manufacture of metal automotive components. The Group specializes in developing innovatively designed products to achieve increasingly safer and lighter vehicles, thereby reducing energy consumption and environmental impact.



CHALLENGE

1. Research and study the product range at Gestamp.
2. **Identify** some of the **problems or opportunities** that using modern technology could address, to improve the product range at Gestamp.
3. **Present an idea** for how modern technology can be integrated into the car to expand the product range at Gestamp.

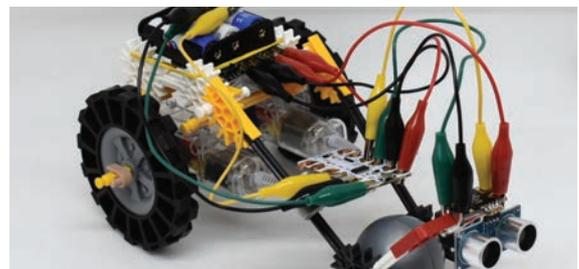
Present in any format to demonstrate your idea, this could include one or more of the following:

- **Research**
- **Sketch or series of sketches**
- **Model** (Physical or CAD)
- **Prototype** of modern technology using electronics or a programmable board

EXAMPLE

Using a programmable board to explore the principles of using modern technology to develop an autonomous vehicle to reduce accidents and CO2 emissions.

This could then be supported using sketches and research to support feasibility of the idea.





CHALLENGE 2 MECHATRONICS ROBOTICS

To design and manufacture a robotic arm to explore use within manufacturing.

Valen Fittings is renowned throughout the industry for being a large diameter fittings & pipe manufacturer. Specializing in producing high quality fittings and bespoke lengths of pipe. They have continued to expand use of technology by automating the process where possible with the installation of robotic cutting & welding equipment.

CHALLENGE

Using the images below and/or the You Tube tutorials, design and manufacture a three part robotic arm to explore use of robotics in manufacturing. We would encourage you to explore and experiment with sizes and design.



MATERIALS AND EQUIPMENT

Card (corrugated), Dowel (skewers), Ruler, Set square, Scissors, Craft knife, Cutting board, Safety ruler, Glue gun, Glue sticks, Syringes (20ml or 10ml), Tube (3mm diameter), Cable ties



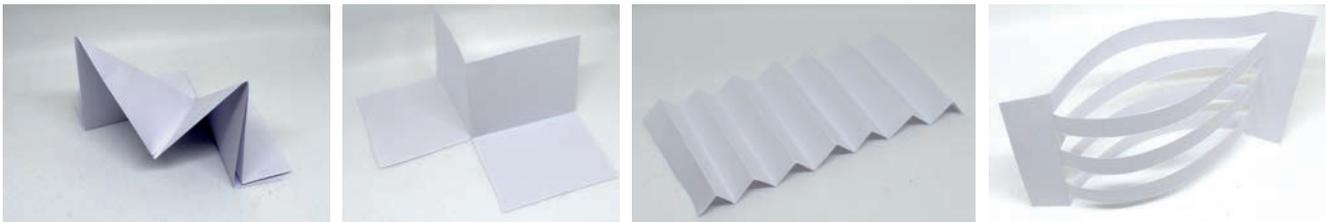
CHALLENGE 3 PRECISION ENGINEERING FABRICATION

To design and prototype a new innovative product using a singular sheet of material, in view of it being CNC machined and press formed.

CHALLENGE

1. SKETCH MODELLING

Explore ideas through simply using a sheet material to experiment with various ways to fold, cut and manipulate the material.



2. IDENTIFY A PROBLEM

Explore the environment you are in, to identify problems that you can create a solution for.



Example: The need for bike storage outside

3. RESEARCH

Use research to identify what solutions are out there already to see if your problem has already been addressed and to validate an opportunity for a new product.

Also use research to explore various methods for folding, cutting and manipulating sheet materials.

PROTOTYPE

Now you have identified a problem and identified there is a need, make a series of refined models as a solution to the problem, you need to now consider measurements.

These can be presented as card models or you could consider using CAD.

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:

<https://www.youtube.com/channel/UCMdccEY1kUiIW13Yzr7ofog>

or by searching In-Comm Training & Services

All challenges and associated resources can also be requested by contacting our team apprenticeships@in-comm.co.uk

CHALLENGE SUBMISSION

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

Deadline for submission: Friday 28th August, 2020

Winners announced: Thursday 3rd September, 2020

Winning entry for each challenge will receive £25 amazon gift voucher

THE CHALLENGES HAVE BEEN SUPPORTED BY SOME OF OUR EMPLOYERS:

