

# The Great *Exhibition* AT HOME

## Week 6

Welcome to the Great Exhibition at Home Challenge.  
Inspired by the Great Exhibition of 1851, we are exploring  
how engineers can help protect the planet.

This is week 6 of The Great Exhibition at Home challenge! You are very close to finishing the challenge, with just two weeks left! Everything you have learned, created, designed and drawn will be fantastic material for your Great Exhibition which is now just around the corner.

Use this week's worksheets to learn about the final 1851ders, The Perfume Fountain and the Public Toilet, and our last inspiring engineer, Lucy Hughes. Then take part in this week's engineering challenges and bring the wonder of the Great Exhibition into your own home!



# 1851der Worksheet 6: Perfume Fountain & Public Toilets



## PAID FOR PUBLIC TOILETS

In 1851, for the first time ever, individual cubicles with flushing toilets became available for members of the public to use. Before then, flushing public toilets for men were not available and public toilets for women didn't exist at all! Engineer George

Jennings, a plumber from Brighton, installed the first paid-for flushing public toilet at the Great Exhibition, where visitors spent one penny for the luxury of a clean toilet seat, a towel, a comb and a shoe shine. This was the start of the phrase 'spend a penny' – although records show that during the original Great Exhibition 675,000 pennies were spent, an expensive trip to the loo!

## TAKE UP THE CHALLENGE!

Although our services and hygiene have improved since 1851, waste disposal is still an issue we face today. From recycling to biodegradable plastic alternatives, engineers are working to reduce and reuse all the things we throw away. Can you use rubbish to create something new? Grab some plastic bottles and tin cans and create your own invention.



## PERFUME FOUNTAIN

Eugene Rimmel, a perfume maker, who was born in France but lived in England for most of his life, created a giant fountain for The Great Exhibition. The fountain sat on top of a splendid base featuring glass cases filled with bottles of 'Great Exhibition Bouquet' perfume. If the stylish bottles didn't convince customers, then ladies could try the perfume on their handkerchiefs – by asking for a spritz from the fountain itself!

## TAKE UP THE CHALLENGE!

You may recognise Eugene Rimmel's name. Although he died in 1887, the cosmetics brand that he created, Rimmel London, is still sold around the world today.

How can cosmetic brands be more sustainable? Chemical engineers are working to find Eco-friendly alternatives for beauty products. Can you create your own perfume using all non-toxic ingredients and 'waste smells'? For example, using discarded orange peel to create a citrus scent!

# Lucy Hughes

Lucy Hughes is a 24 year old engineer from the UK. While studying product design at the University of Sussex, she developed an exciting new material called MarinaTex, which is causing waves in the engineering industry.

## What is MarinaTex?

MarinaTex is a new material which could provide an alternative to plastic packaging. Unlike plastic, MarinaTex can biodegrade in just 4-6 weeks and does not give off harmful chemicals meaning it is suitable for home composting.

## How can MarinaTex help the environment?

Our current world is dependent upon single use plastic in our everyday lives. The lifespan of plastic is not suited for this purpose – it is estimated that a plastic bottle may take 450 years to biodegrade! With endless waste building up at landfill sites it is becoming more and more urgent to find new materials to replace plastic which do not have the same environmental footprint.

## What is MarinaTex made from?

It is made using 100% organic materials. The main components are sourced from the sea. This includes agar from red algae and proteins from fish processing waste. In the UK alone, 172,702 tonnes of fish waste is produced annually from land based processing. Repurposing waste in this way means MarinaTex aims to work within a circular economy rather than adding to the problem.

## How did Lucy create a new material?

Lucy noticed that there were lots of waste materials in the fish processing industry that were unused. She researched the different waste streams and she discovered that fish skins and scales had the most potential locked up in them, due to their flexibility and strength enabling proteins.

However, in order to give these proteins something to attach to and create a brand new material she had to find an organic binder. Keen to keep the solution local in order to reduce transportation, she looked to the Sussex coastline, experimenting with different organic marine binders before finally settling on agar. It took over 100 different experiments to refine the material and process, most of which she did on the kitchen stove of her student accommodation.

## NOW IT'S YOUR TURN

Think more carefully about the materials you can find in your house. Do some research about which are the most eco friendly materials to build with, or make clothes out of. Once you have done this think about designing a brand new material like Lucy. what would it be used for? How would it be environmentally friendly? What problem would it seek to solve?

You've learnt a lot over the past 6 weeks. You now know all about the intriguing 1851ders from the original Great Exhibition as well as some of the exciting work engineers are doing to help protect the planet right now. Armed with all this knowledge, as well as the fantastic work you have been doing yourself you are now ready to start thinking about making your own Great Exhibition. We can't wait to see what you do.

Join us next week for help with creating your own Great Exhibition at Home, as well as making your 1 minute video submission to be in with a chance of winning some exciting prizes!

