Mathematical Studies: Pre-Enrolment Activity 2025

Welcome to the Mathematics department at Durham Sixth Form Centre. Please complete this activity before you begin your studies in September and bring the completed task with you during the first week of lessons.

| **Aim of the activity:** |
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| This task is designed for you to apply some key topics from GCSE which will then be extended as part of the Mathematical Studies course while giving you an overview of the course. Use of Maths in practical contexts is a key part of the course and we are interested to know which skills you have already covered at GCSE. |
| **Instructions for completing the activity:** |
| **Task 1 - Making food and drink cans**
One of the features of the Mathematical Studies exams is the use of pre-release material. This is information that we are given to study before the exam so that we are prepared better for the assessment. We would like you to have a go at using part of a previous pre-release (the material changes from year to year, this will not be used in your exams).

1. Watch the first 3 minutes of this video on the manufacture of drinks cans.
2. Now have a look at the pre-release material 'Making food and drink cans'. Make a list of questions that you think the examiners may ask.
3. Use 'Cylinders Review' to revise maths used in cylinders if you need. Have a go at the 'Cylinders Questions' we came up with. There are answers at the end of the questions for you to check.
4. Try these shorter questions before you look at task 2. Your teacher will go through this with you on the first week:
    a. Estimate the dimensions (height and radius) of a regular can of coke (330ml).
    b. Estimate the volume of coke in a regular can of coke in cm^3.
    c. Estimate the volume of coke consumed in the UK in one year.
    d. Estimate the minimum number of cans of coke needed to be produced in the UK in one year.

Task 2:
Putting together what you have done in task 1 and the material given to you, answer the following question.

A food company is making a new soup product. the soup will be put into a new size of can.
In a trial run, the food company produced between 1900 and 2150 litres of soup per hour (1 litre = $1000cm^3$).
The company manager asks a can manufacturer to supply three-piece cans with diameter 7cm and height 9cm.
The can manufacturer must buy 1m by 1m sheets of steel to make the cans:
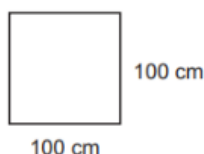
Estimate how many sheets of steel the can manufacturer will need to make enough can for **one week** of soup production. State any assumptions you make and give your answer to the nearest 10 sheets

Note: There is more than one solution, so your answer may be different to someone else's. You should be focusing on the methods that you have used. |

Evidence/Work to be brought to your lessons for the first week in September:

Bring your work from both tasks to your lessons in the first week. Your teacher will give you feedback on this question.

Both tasks will be used to assess your knowledge and any gaps in understanding will be addressed during the course.