FREEDOM FOR THINKERS

## Year 6 Mathematics Poster Competition

Exeter Maths School (EMS) is challenging your year 6 students to take part in our annual Mathematics Poster Competition.

The Mathematics Poster Competition is intended to stimulate and motivate students and offers young mathematicians the opportunity to share their love of the subject in an interesting and engaging manner. By taking part, students will develop their ability to communicate and explain mathematics whilst expressing their creativity and developing their mathematical understanding.

The theme for this year's competition is: Ancient Egyptian Fractions

Further details with specific requirements can be found overleaf.

The competition is open to students in Year 6. Students may enter as individuals or as part of a small team (maximum of 4 students per team). Schools may enter as many teams as they like. The winner of the Mathematics Poster Competition will receive a mathematical prize.

To take part, please send in completed posters, along with the attached entrance form (one per poster) by Monday, $26^{\text {th }}$ June. Schools will be notified of the result before the end of the summer term.

Completed posters should be sent for the attention of: Poster Competition, Exeter Maths School, Rougemont House, Castle Street, EXETER EX4 3PU.

We hope that you will encourage your students to take part - we are certainly looking forward to seeing their work!

## MESME Maths Circles

Please also find enclosed details of our MESME Maths Circles programme for year 7 students in the 2023-24 academic year.

We would be grateful if you could please share this information with the parents and carers of students who may be interested in taking part and encourage them to complete the linked 'Expression of Interest' form.

The questions, tasks, and explorations in MESME Maths Circles have been carefully created to support, challenge, and develop students with an aptitude and passion for mathematics. Therefore, we recommend children who:

- Achieved "Greater Depth" in their KS2 Maths SATS. In the 2022-23 academic year, this corresponds to a score of 111 and above for disadvantaged students, and 113 and above for other students
- Are showing you that they are enthusiastic mathematicians, for example by their engagement in lessons, their interest in maths puzzles, or by their participation in UKMT maths challenges

If you have any questions concerning the Poster Competition or MESME Maths Circles, please contact the Outreach Team via: events@exeterms.ac.uk

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## Year 6 Mathematics Poster Competition <br> Produce an A3 poster with the title: Ancient Egyptian Fractions

## Background:

The Ancient Egyptians didn't write fractions like we do. They wouldn't have written $\frac{3}{4}$. They would have written $\frac{1}{2}+\frac{1}{4}$.
This is because they only wrote fractions as sums of unit fractions - fractions with a 1 as the numerator.
Similarly, $\frac{4}{5}$ would have been written as $\frac{1}{2}+\frac{1}{4}+\frac{1}{20} \ldots$ although this is not the only way it could have been written.
(Note that the unit fractions all have to be different - they wouldn't have written $\frac{4}{5}$ as $\frac{1}{5}+\frac{1}{5}+\frac{1}{5}+\frac{1}{5}$ )
We can sometimes use Egyptian fractions to share things more quickly. If we wanted to share 3 pizzas between 4 people, we can see everybody would end up with $\frac{3}{4}$ of a pizza. So we could cut all the pizzas into quarters and give everybody 3 pieces.

Or, we could give everybody $\frac{1}{2}+\frac{1}{4}$ by cutting enough halves for $\frac{1}{2}$ each, and then cutting the rest into quarters. Like this:


## Task:

Explore how to write fractions as Egyptian fractions, and how they can be used.

## Your poster should include:

- Explanations of unit fractions and Ancient Egyptian Fractions
- Some Egyptian fractions you've worked out yourself (e.g. $\frac{5}{8}$ and $\frac{2}{5}$ )
- A demonstration of how Egyptian fractions can be used for sharing (e.g. 5 pizzas shared between 8 people)
- Any other ideas you'd like to explore - e.g. find more than one Egyptian fraction for the same value (e.g. $\frac{4}{5}$ ), explain how you worked out your fractions (and can you find out about Greedy Algorithms?), find out how the Ancient Egyptians actually wrote unit fractions (hint: they didn't write two numbers on top of each other with a line in between)


## Your poster will be given marks for:

- Mathematical content
- Creativity
- Overall presentation

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## Year 6 Mathematics Poster Competition <br> Ancient Egyptian Fractions

Anjali, Billy, Caleb and Debbie are going to share 3 pizzas between them.

They could cut every pizza into quarters and then everyone take one piece from each pizza. In the diagram below the first pizza is chopped up already:


Slice up the other two pizzas and share them out between the four people. You should find that everyone gets 3 quarter pieces. 3 pizzas shared between 4 people means everyone gets $\frac{3}{4}$.

Another way they could share the pizzas is to cut it up in Egyptian fractions. They could start by deciding there is definitely enough pizza for everyone to have at least $\frac{1}{2}$ a pizza each. So they can cut up the first two pizzas and share them like this:


Share out the last pizza between everyone. Now everyone gets a half and a quarter, but it's the same amount of pizza as before.

This means that $\frac{3}{4}=\frac{1}{2}+\frac{1}{4}$
This is an Egyptian fraction. The Ancient Egyptians wrote their fractions as a sum of unit fractions (these are the fractions with a 1 on top).

Find some more Egyptian Fractions by sharing out other pizzas in the same sort of way.

Share these 3 pizzas between 8 people:


$$
\frac{3}{8}=
$$

Share these 5 pizzas between 8 people:


$$
\frac{5}{8}=
$$

Share these 5 pizzas between 6 people:


Share these 2 pizzas between 7 people (this one's a bit harder!):

$\frac{2}{7}=$

