

MathsJam Shout

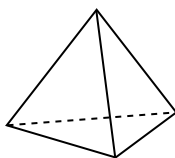
October 2023
Coventry MathsJam

Play ^{4 of} 16

Using a set of cards with the integers 1-100 on (you could use a copy of 6 Nimmt! or The Game, or make your own) play this game, then think about why it's always possible.

Shuffle the cards and deal 16 of them on to the table, then: pick out a set of **four** cards such that if you place them in **two pairs**, the pairs both have the **same sum**.

Make Tetrahedron



Make your own tetrahedron! Options include:

- Follow the instructions at bit.ly/construct-tetrahedron to draw a tetrahedron net using ruler-and-compass, then fold up and glue it
- Bring some string or cotton, steal drinking straws from the bar, cut them into short lengths and create a wireframe tetrahedron.
- Use A-ratio paper and mathigon.org/origami/tetrahedron

Some of this month's puzzles and activities are inspired by puzzles from Warwick Uni's Poincaré Magazine. For more information, visit discord.gg/HZuQXjtCVZ

Prove that in every tetrahedron, there is a vertex where three edges meet whose lengths are the sides of a triangle.

Puzzle Flipping Unfair

Alice and Bob each have a positive number of fair coins, with Alice having exactly one more than Bob. If both throw all of their coins simultaneously, what is the probability that Alice gets more heads than Bob?



Puzzle Cubing the Cube

Suppose we have a cube with side length 3, and we wish to cut it into its 27 constituent unit cubes (like breaking a Rubik's cube). Each cut must be a straight line and must pass all the way through any pieces involved (as if passing a 2D plane through), but we are allowed to move the pieces around between each cut, and possibly cut more than one piece at once in this way. What is the minimum number of cuts required?

MathsJam Shout is a monthly sheet of ideas for activities to do at a MathsJam night. It's created using suggestions from a different MathsJam each month, and if you'd like to submit suggestions for a month in the future, email katie@mathsjam.com for details.

MathsJam is a monthly opportunity for like-minded self-confessed maths enthusiasts to get together in a pub and share stuff they like. Puzzles, games, problems, or just anything they think is cool or interesting. Monthly MathsJam nights happen in over 70 locations around the world, on the second-to-last Tuesday of each month. To find your nearest MathsJam, visit the website at www.mathsjam.com.



This model required two sheets of A4 or letter. Fold both sheets according to these 8 steps.

1 	2 	3 	4
		Turn over	
5 	6 	7 	8
	Unfold	Turn over and repeat steps	Cut off remaining paper

Fold one of the sheet according to the following steps. The second unit has to be folded as mirror image.

9 	10 	11 	12
			Flip over and reinforce all folds

Now we interlink both unit. The two central triangles in each unit will form the four outer faces of the Tetrahedron.

13 	14 	15 	16
Place unit on top of each other.	Fold the bottom unit into a tetrahedron.	Wrap the second unit around the first one	Insert the final flap into the last gap.