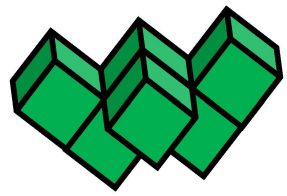
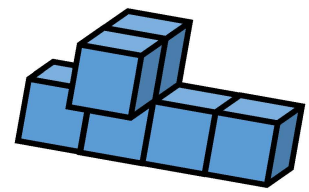
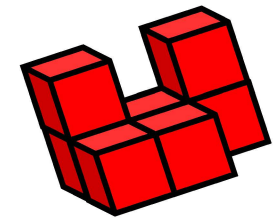
# MathsJam Shout

**April 2023**
**London MathsJam**

# Make

## Symmetric Eventies

For each of these shapes, make two copies from connectable cubes, then combine the two shapes to make a shape with threefold symmetry. More examples: **marchland.org/even**

# Evaluate

Evaluate $\cos(20°) \cdot \cos(40°) \cdot \cos(80°)$ without a calculator, giving your answer as a rational fraction.

# Play Median

**A game for an odd number of players.** Using a random number generator of your choice (e.g. cards, dice, your calculator's random number function, etc.), generate a set of four random numbers.

Each player then uses all of these numbers along with the addition, subtraction, multiplication and division operators to generate a number, hidden from the other players.

Once all players are ready, they compare their results, and whoever has the **median** number wins a point for that round. Continue playing until one player has 5 points, and wins the game.

For an advanced version, allow any mathematical functions, provided the result is a real number. What other rules could you add to make the game more interesting?

# Problems

## Kissy Kiosk

This is a problem set about programmable symbol sequences.

**PDF: bit.ly/kissy-kiosk**

# Puzzle

## 3D Knights

Imagine a 3×3×3 3D chessboard, with knights positioned on every square except the middle one. Knights can make a move two squares in one direction (forward, backward, up, down, left or right) and then one square in a different direction at 90° to the first direction.

Is it possible for all the knights to move simultaneously and end up on different squares?

What about a 3×3×4 chessboard with knights on every square?

**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**.