CHOOSE MATHS

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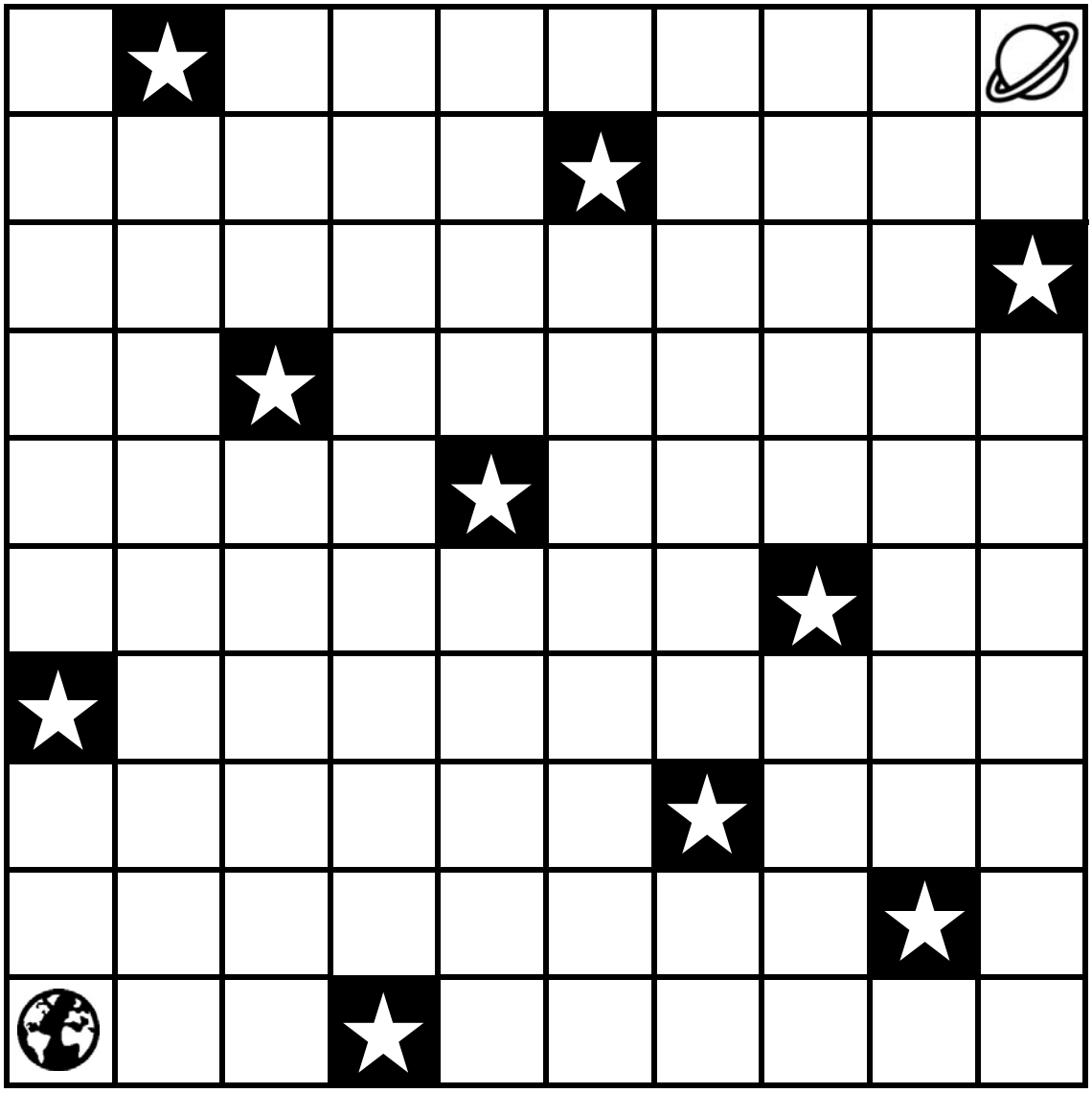
Space Race Game



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‘Space Race’ Algorithmic Thinking Game

Materials

- Game board in A3 size (one between two players)
- 6-sided dice (OR 2 x 6-sided die for ‘extension’ version OR 3 sided dice for ‘enabling’ version).
- 2 coloured counters (Player markers or ‘Spaceships’)

Instructions

This is a game for two players and so the board is shared.

Each player chooses a different coloured ‘Spaceship’ (counter) and starts on the Earth space in the bottom left hand corner.

Players take turns to roll a 6-sided dice. They then choose to move either ‘up’ or ‘down’, or ‘left’ or ‘right’.

Players cannot make a move if it either lands on or passes through a star. For example, if a player rolls ‘4’ first turn, they cannot move as they would hit the star in the far-left column or the bottom row. If a Player can’t make a move with their rolled number, they must miss a turn.

The winner is the Player to land exactly on the Planet space in the top right corner. (They must roll a combination that can place them on the Planet rather than ‘overshooting’ the Planet).

Extension: Players take turns to roll **two** 6-sided dice. They then choose one rolled number to be either ‘up’ or ‘down’, and the other number rolled to be either ‘left’ or ‘right’. It does not matter in which order they move ‘left/right’ or ‘up/down’.

Players still cannot make a move if it either lands on or passes through a star. For example, if a player rolls ‘4’ and ‘2’ in their first turn, they cannot choose ‘4 up, 2 right’ as the ‘4 up’ would hit the star in the far-left column.

In this version of the game, it is much harder to land exactly on the New Planet!

Enabling: Use a dice with a restricted number range, to reduce the size of the number rolled.

Teaching points:

After one or two games, ask students to record their ‘steps’ using pictures, words or numbers as they move toward the New Planet. Do not prompt them on *how* to do this. Then, share the results.

How did students record the steps?

How could we record this in a way that would allow someone to repeat the steps and follow our ‘spaceship’s’ pathway?

Introduce the use of an algorithm (set of mathematical instructions describing a pattern, a sequence or pathway between two points) to describe the trajectory of the spaceships (eg. “U2, R5, U3, R3, U4, R1”).

Have students to record their own algorithmic sequence and then have a friend use the algorithm to retrace the spaceship’s journey.

For further enrichment, see also Khan Academy’s “Route Finding” blog post:
https://www.khanacademy.org/computing/computer-science/algorithms/intro-to-algorithms/a/route-finding