[MATHS PROBLEM]

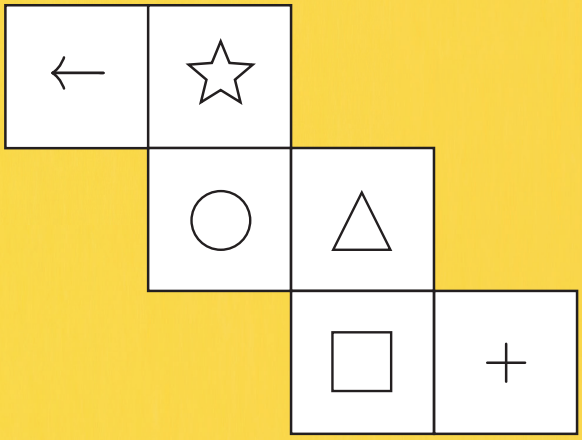
NETS AND DICE

When working with nets, students often struggle to visualise in three dimensions, says **Colin Foster**

In this lesson, students tackle challenging problems involving nets by making sketches to support their reasoning

THE DIFFICULTY

Look at this figure.
Will it fold up to make a cube? Why / why not?



It *will* make a cube, though students might need paper and scissors to verify this.

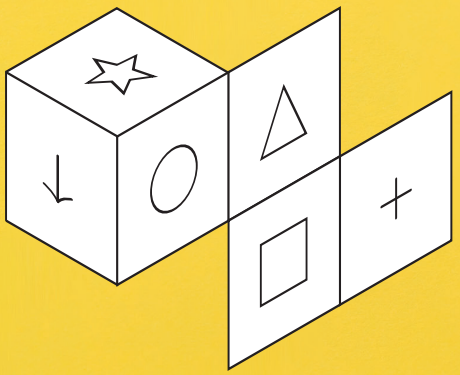
In the finished cube, which symbol will the arrow be pointing at?

Students are likely to find this difficult without cutting and folding. The answer is the 'square'.

THE SOLUTION

Can you work it out without any cutting – just by using your imagination?

Imagine folding the star face back and the arrow face down.

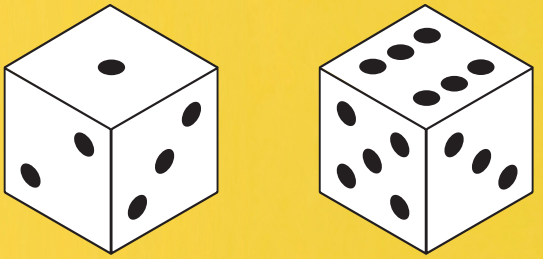


Can you see the answer now?

Which face will be opposite the '+' face?

Some students may find this much more difficult than others and need additional sketches. The answer is the 'circle' face.

Checking for understanding
Could these two dice be identical? Why / why not?



They are both standard right-handed dice, with the numbers in the correct positions, but the orientation of the pips on the '3' face is inconsistent. If we rotate the left die 180° about an axis through the centre of the '3' face, the '5' face and '6' face would become visible as shown on the right, but the pips would be going bottom left to top right – not top left to bottom right – so both dice cannot be completely identical.

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