AIMSSEC

AFRICAN INSTITUTE FOR MATHEMATICAL SCIENCES
SCHOOLS ENRICHMENT CENTRE (AIMSSEC)
AIMING HIGH

CURIOUS NUMBER

Can you use the digits 1, 2, 3, 4, 5 and 6, each only once, to make a number that is divisible by 6 with the following properties:

the first digit from the left is divisible by 1
the number formed by the first 2 digits from the left is divisible by 2
the number formed by the first 3 digits from the left is divisible by 3
the number formed by the first 4 digits from the left is divisible by 4
the number formed by the first 5 digits from the left is divisible by 5
the number formed by all 6 digits is divisible by 6?

Help

You could work with a partner or by yourself to try to decide which of the following 4-digit numbers are solutions to the puzzle.

What do you notice about the patterns in the way the numbers are written in rows and columns. Why do you think that the numbers have been arranged in this way?

Start by crossing out all the numbers in the list that you know **cannot** be solutions:

1234, 1243, 1324, 1342, 1423, 1432

2134, 2143, 2314, 2341, 2413, 2431

3124, 3142, 3214, 3241, 3412, 3421

4123, 4132, 4213, 4231, 4312, 4321

Extension

You could attempt to order the ten digits from 0 - 9 in the same way. Either play the challenging **American Billions Game** with a friend or try this challenge as a solitaire puzzle.

You take it in turns to choose and place a card to the right of the cards that are already there.

After two cards have been placed, the two-digit number must be divisible by 2.

After three cards have been placed, the three-digit number must be divisible by 3.

After four cards have been placed, the four-digit number must be divisible by 4.

And so on!

Keep taking it in turns until one of you gets stuck.