Task: Magic Threes

Set the scene:

1. Ask a student to pick FOUR numbers (integers).
2. Pick two of them whose difference is a multiple of three.
3. Write the pair beside the student's triple.
4. Repeat, building a table that looks like this:

Numbers				Differences	
4	1	5	7	7-1	6
7	21	7	6	21-6	15
80	2	5	3	80-2	78
8	7	6	5	8-5	3

5. Challenge students to spot what is special about the numbers in the last column.
6. Repeat (1)-(5) until someone sees the last column is always divisible by 3 (will be more obvious if they choose smaller numbers).
7. Applaud spotting the pattern.

Challenge:

Is this always possible?

Can you find four numbers so that NO two have a difference that is a multiple of three?