Ramsey theory considers the problem of finding monochromatic sub-structures of a given coloring. The opposite extreme is to look for sub-structures that are rainbow colored, i.e., which have no repeated colors. We consider the rainbow variation of the van der Waerden problem, i.e., the minimum number of colors needed to guarantee the existence of a rainbow arithmetic progression inside a coloring of $[n]$. In particular this has a significant variance between 3-term progressions and 4-term (or higher) progressions.

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