

- Complete the table below showing the number of valence electrons, the Lewis structure and the VSEPR predicted shape of each of the following species.

Formula	Number of valence electrons	Lewis structure	Geometry of species
e.g. NH <sub>3</sub>	8	$\begin{array}{c} \text{H}-\ddot{\text{N}}-\text{H} \\   \\ \text{H} \end{array}$	trigonal pyramidal
CH <sub>4</sub>	8	$\begin{array}{c} \text{H} \\   \\ \text{H}-\text{C}-\text{H} \\   \\ \text{H} \end{array}$	<b>tetrahedral</b>
CO <sub>2</sub>	16	$\text{:}\ddot{\text{O}}=\text{C}=\ddot{\text{O}}\text{:}$	<b>linear</b>
PF <sub>5</sub>	40	$\begin{array}{c} \text{:}\ddot{\text{F}}\text{:} \\ \text{:}\ddot{\text{F}}\text{:} \\ \text{:}\ddot{\text{F}}\text{:} \\ \text{:}\ddot{\text{F}}\text{:} \\ \text{:}\ddot{\text{F}}\text{:} \\   \\ \text{P} \\   \\ \text{:}\ddot{\text{F}}\text{:} \end{array}$	<b>trigonal bipyramidal</b>
NO <sub>3</sub> <sup>-</sup>	24	$\left[ \begin{array}{c} \text{:}\ddot{\text{O}}\text{:} \\    \\ \text{:}\ddot{\text{O}}\text{:}-\text{N}-\text{:}\ddot{\text{O}}\text{:} \\   \\ \text{:}\ddot{\text{O}}\text{:} \end{array} \right]^{-}$	<b>trigonal planar</b>

Which one of the species above displays resonance, and how many resonance forms are possible?

**NO<sub>3</sub><sup>-</sup> shows resonance – three forms are possible:**

