

# REDOX <br> <br> REACTIONS 

 <br> <br> REACTIONS}

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## Finoling oxidation numbers

## Oxidation Numbers in Charged Compounds

## Example 3: $\quad \mathrm{MnO}_{4}^{-}$

Step 1: Identify the oxidation number that is known

- Oxygen has an oxidation number of -2

$$
\begin{gathered}
\mathrm{MnO}_{4}^{-} \\
-2
\end{gathered}
$$

Step 2: Since we do not know the oxidation number of $M n$ we have to do some math to figure it out.


Let's put this into an algebraic equation and solve for $x$ or the oxidation number of Mn .

$$
\begin{aligned}
& \mathrm{Mn} \mathrm{O}_{4}-\begin{array}{l}
\text { The total charge of the compound } \\
\text { is }-1, \text { so we set the equation equal } \\
\text { to the total charge }
\end{array} \\
& \mathrm{x}+(-8)=-1 \\
& +8 \quad \begin{array}{l}
\text { Solve for } x \text { by adding } 8 \text { to both sid }
\end{array} \\
& x=+7
\end{aligned}
$$

Oxidation numbers:
$M n=+7$
$\mathrm{O}=-2$

> The oxidation number of oxygen is -2 not -8 , we used -8 to help find the oxidation number of $M n$, that was its only purpose.

