

REACTION CATEGORY	SINGLE REPLACEMENT																												
REACTION DESCRIPTION	<p>In these reactions, a free element reacts with a compound to form another compound and release one of the elements of the original compound in the elemental state. There are two different possibilities:</p> <ol style="list-style-type: none"> 1. One cation (+ ion) replaces another. 2. One anion (- ion) replaces another. 																												
REACTION FORMAT	<ol style="list-style-type: none"> 1. $AB + C \rightarrow CB + A$ 2. $A + BC \rightarrow BA + C$ 																												
REACTION GUIDELINES	<p>1. In a single replacement reaction atoms of one element replace the atoms of a second element in a compound. Whether one metal will replace another metal from a compound can be determined by the relative reactivities of the two metals. To help us determine this, an activity series of metals arranges metals in order of decreasing reactivity. A reactive metal will replace any metal listed below it in the activity series.</p> <div style="border: 1px solid black; padding: 10px; margin: 10px auto; width: fit-content;"> <p style="text-align: center;">ACTIVITY SERIES OF METALS</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">METAL</th> <th style="text-align: left;">SYMBOL</th> </tr> </thead> <tbody> <tr><td>Lithium</td><td>Li</td></tr> <tr><td>Potassium</td><td>K</td></tr> <tr><td>Calcium</td><td>Ca</td></tr> <tr><td>Sodium</td><td>Na</td></tr> <tr><td>Magnesium</td><td>Mg</td></tr> <tr><td>Aluminum</td><td>Al</td></tr> <tr><td>Zinc</td><td>Zn</td></tr> <tr><td>Iron</td><td>Fe</td></tr> <tr><td>Lead</td><td>Pb</td></tr> <tr><td>(Hydrogen)</td><td>(H)*</td></tr> <tr><td>Copper</td><td>Cu</td></tr> <tr><td>Mercury</td><td>Hg</td></tr> <tr><td>Silver</td><td>Ag</td></tr> </tbody> </table> <p style="margin-top: 10px;">*Metals from Li to Na will replace H from acids and water; from Mg to Pb they will replace H from acids only.</p> </div> <p>2. A nonmetal can also replace another nonmetal from a compound. This replacement is usually limited to the halogens (F₂, Cl₂, Br₂, and I₂). The activity of the halogens decreases as you go down the Group (17) of the periodic table.</p>	METAL	SYMBOL	Lithium	Li	Potassium	K	Calcium	Ca	Sodium	Na	Magnesium	Mg	Aluminum	Al	Zinc	Zn	Iron	Fe	Lead	Pb	(Hydrogen)	(H)*	Copper	Cu	Mercury	Hg	Silver	Ag
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REACTION GUIDELINE EXAMPLES	<ol style="list-style-type: none"> 1. $Mg + Zn(NO_3)_2 \rightarrow Mg(NO_3)_2 + Zn$ <i>Mg replaces Zn; Mg is above Zn on the chart</i> $Mg + 2 AgNO_3 \rightarrow Mg(NO_3)_2 + 2 Ag$ <i>Mg replaces Ag; Mg is above Ag on the chart</i> $Mg + LiNO_3 \rightarrow \text{No Reaction (NR)}$ <i>Mg cannot replace Li; Li is above Mg on the chart</i> 2. $Cl_2 + 2NaBr \rightarrow 2NaCl + Br_2$ 																												