

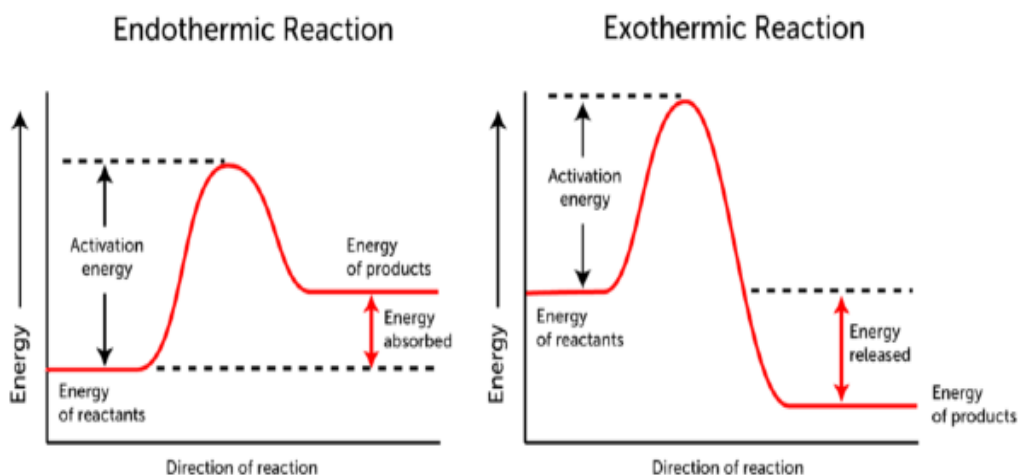
## Exothermic and Endothermic Reactions



<https://www.youtube.com/watch?v=d6fl3U0rt4k>

<https://www.youtube.com/watch?v=L-G7pLufXAo>

	<b>Exothermic reactions</b>	<b>Endothermic reactions</b>
Def	reaction which releases energy	reaction which absorbs energy
Energy placed	on product side	on reactant side
Chemical reaction	$\text{CH}_4 + 2 \text{O}_2 \Rightarrow \text{CO}_2 + 2 \text{H}_2\text{O} + \text{energy}$	$2 \text{H}_2\text{O} + \text{energy} \Rightarrow 2 \text{H}_2 + \text{O}_2$
Temperature change	Heat energy is released, this means temperature increases and environment is warmer. Thermometer will increase.	Heat energy is absorbed, to break the bonds, this means temperature decreases and environment is colder. Thermometer will decrease.
Examples	combustion, rust and neutralization	boiling and melting



Identify the following as exothermic or endothermic reactions.

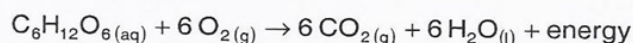
combustion of gas in a car engine	exo
baking a cake	endo
emission of light by fireflies	exo
photosynthesis	endo
respiration	exo
bomb explosion	exo
$2\text{Na}(s) + \text{Cl}_2(s) \rightarrow 2\text{NaCl}(s) + 822\text{kJ}$	exo
melting ice cubes	endo
first aid cold compress	endo
rusting iron	exo
water evaporating	endo
condensation of water	exo
glowstick	exo

## Past exam question

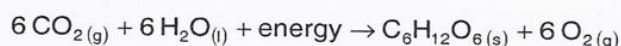
1. Endothermic and exothermic reaction equations indicate the role that heat and energy plays in a chemical reaction. Below is a list of examples of endothermic and exothermic reactions.

A. When a sample of potassium nitrate,  $\text{KNO}_3$ , was dissolved in water,  $\text{H}_2\text{O}$ , the temperature of the water dropped from  $22\text{ }^\circ\text{C}$  to  $17\text{ }^\circ\text{C}$ .

B. The equation for cellular respiration is:



C. The equation for photosynthesis is:



D. When sulphuric acid,  $\text{H}_2\text{SO}_4$ , was added to a sample of water, the temperature of the water increased.

Determine which examples are exothermic and which are endothermic.

2. Determine if the picture below represents an exothermic or endothermic reaction. Justify your answer

