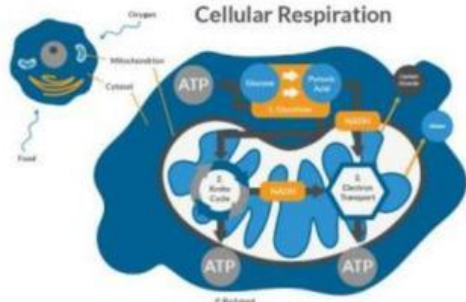


Task 1

Please fill with the correct branches of chemistry related to the following phenomena!

No	Phenomenon	Branches of Chemistry
1	 #17 Alcohol breath test (Criminal Behaviour Analyzer) Clue 1: Detecting and measuring a substance in breath <i>Chemical Reaction/Process:</i> Ethanol reacts with $K_2Cr_2O_7$ (color change)	
2	 #12 Cellular respiration converting glucose into energy Clue: A living cell turning food into usable energy. <i>Chemical Reaction/Process:</i> $C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O + ATP$	
3	 #6 The Production of Synthetic Dyes Clue: Synthetic dyes are made from several compounds, such as Iron (II) oxide or FeO and Titanium dioxide (TiO_2)	

No	Phenomenon	Branches of Chemistry
4	#5 Synthetic perfume/fragrance production Clue: Combining carbon compounds to make a nice smell Chemical Reaction/Process: Esterification: $\text{alcohol} + \text{acid} \rightarrow \text{ester} + \text{H}_2\text{O}$	
5	#13 Ice compress to reduce fever and reduce injury pain Clue 1: Heat moving from a warm body and injuries to something cold Chemical Process/Reaction: Endothermic heat transfer	
6	#14 Fridge absorbing and transferring heat via refrigerant Clue 1: A machine moving heat from inside to outside Chemical Process/Reaction: Thermodynamic cycle, phase change of refrigerant	

No	Phenomenon	Branches of Chemistry
7	#18 Tap water quality test (chlorine, pH, turbidity) Clue 1: Checking if water is clean/safe by testing it <i>Chemical Reaction/Process:</i> Titration / instrumental measurement	
8	#4 Combustion of gasoline/diesel in vehicles Clue: Burning a carbon-based fuel <i>Chemical Reaction/Process:</i> $C_8H_{18} + O_2 \rightarrow CO_2 + H_2O + \text{energy}$	
9	#16 Blood sugar measurement with a glucometer Clue 1: A tool that measures how much of something is present <i>Chemical Reaction/Process:</i> Enzymatic reaction with glucose oxidase	

No	Phenomenon	Branches of Chemistry
10	#3 Soap making from oil/fat Clues: 1. Fat + a strong alkaline liquid = soap 2. <i>Chemical Reaction:</i> Triglyceride ($C_6H_5O_6$) + NaOH $\rightarrow$ soap + glycerol	
11	#2 Fermentation of cassava in tape production by microorganisms Clues: 1. Living microbes breaking down sugar/starch 2. <i>Chemical Reaction:</i> $C_6H_{12}O_6 \rightarrow 2C_2H_5OH + 2CO_2$	
12	#8 Chemical reactions inside a vehicle battery Clue 1: Metal reacts with acid producing electricity <i>Chemical Process/Reaction:</i> $Pb + PbO_2 + 2H_2SO_4 \rightleftharpoons 2PbSO_4 + 2H_2O$	

No	Phenomenon	Branches of Chemistry
13	#20 BPOM testing for borax/formalin content in snacks Clue: Testing food to detect a hidden harmful substance Chemical Reaction/Process: Turmeric paper turns red-brown with borax.	
14	Plastic production from petroleum Clues: Made from carbon-based molecules joined into long chains, called <i>polyethylene</i> (C_2H_4).	
15	#7 Table salt production from seawater evaporation Clue 1: A mineral/salt crystal forming from water Chemical Process/Reaction: Crystallization of Salts ($NaCl$)	