

GLYCOLYSIS

	REACTANTS	PRODUCTS	ENZYME	REACTION TYPE
1	Glucose + ATP	Glucose 6 (P) + ADP	phosphorylase (kinase)	phosphorylation
2	G 6 (P)	Fructose 6 (P)	isomerase	isomerization
3	F 6 (P) + ATP	Fruc-1,6 di(P)	phosphorylase	phosphorylation
4	F 1,6 di(P)	DHAP PGAL	aldolase	cleavage
5	DHAP	PGAL	isomerase	isomerization
6	PGAL + NAD ⁺	DPGA + NADH	dehydrogenase	redox
7	DPGA + ADP	3 PGA + ATP	dephosphorylase	dephosphorylation
8	3 PGA	2 PGA	isomerase	isomerization
9	2 PGA	PEP + H ₂ O	dehydratase	dehydration
10	PEP + ADP	Pyruvate + ATP	dephosphorylase	dephosphorylation
*11	Pyruvate + NADH	Lactate + NAD ⁺ (lactic acid)	dehydrogenase	redox

used up - 2 ATP

produced + 4 ATP

Net ATP yield = (+ 2)

Also yields 1 NADH. and 1 waste H₂O

KREBS' CYCLE

	REACTANTS	PRODUCTS	ENZYME	REACTION TYPE	
PREP STEP	pyruvate + NAD^+	Acetyl coA CO_2 + NADH	pyruvate decarboxylase dehydrogenase	oxidative decarboxylation	redox
2C + 4C = 6C	1 Acetyl CoA + OAA	citrate	synthase	synthesis	
	2 citrate	isocitrate	isomerase	isomerization	
5C	3 isocitrate + NAD^+	α Ketoglutarate + NADH	decarb/dehyd	oxidative decarboxylation	redox
4C	4 α Ketoglutarate + CoA + NAD^+	Succinyl coA + NADH + CO_2	decarboxylase dehydrogenase	oxidative decarboxylation	redox
"	5 Succinyl coA + GDP + P_i	Succinate + CoA + GTP	phosphorylase	substrate-level phosphorylation	
"	6 Succinate + FAD	Fumarate + FADH_2	dehydrogenase	redox	redox
"	7 Fumarate	Malate + H_2O	dehydrase	dehydration	
"	8 Malate + NAD^+	Oxaloacetate OAA + NADH	dehydrogenase	redox	

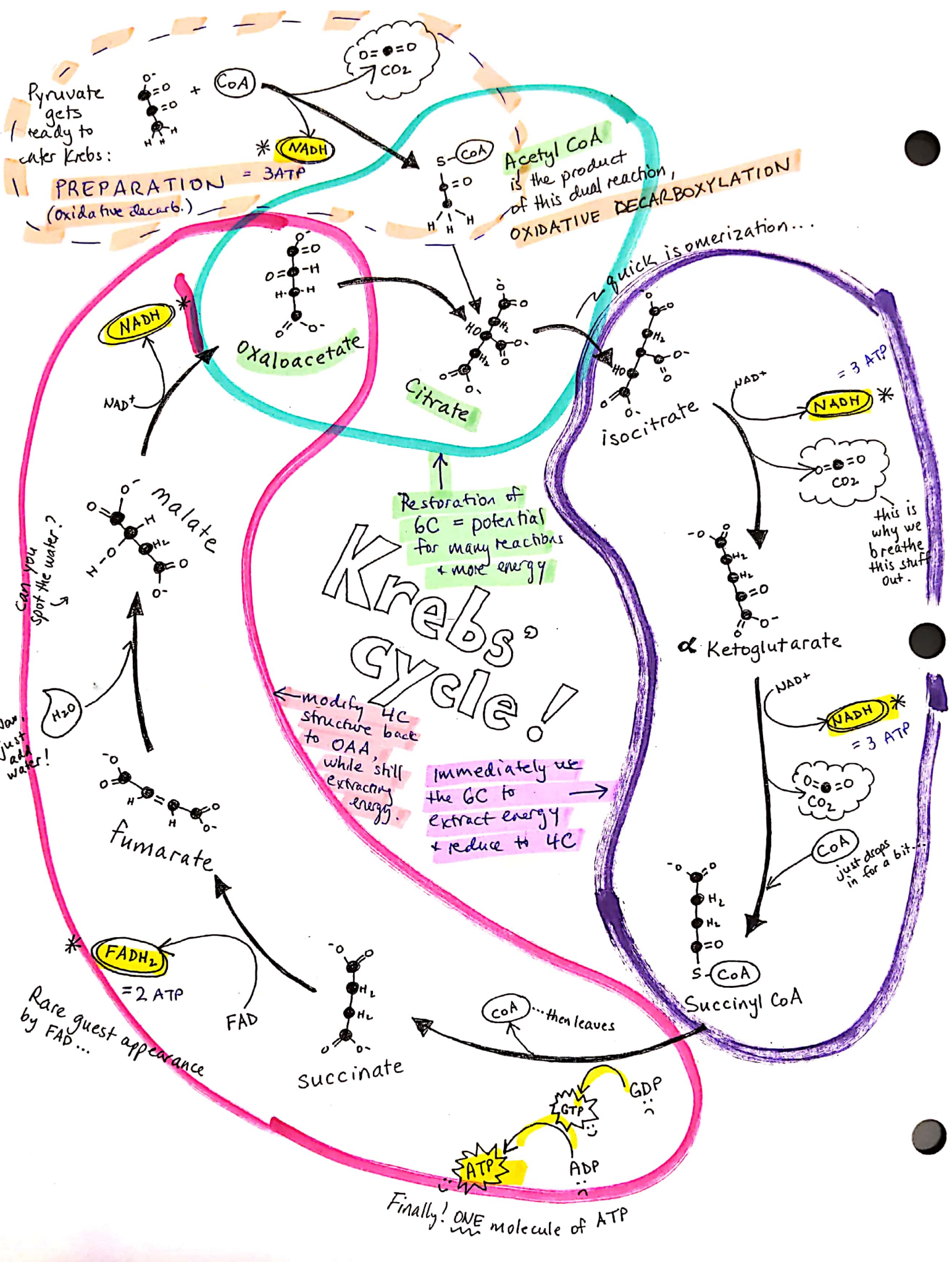
4 NADH per cycle (per pyruvate)

1 FADH_2 per cycle (p.p.)

1 GTP per cycle

3 CO_2 waste

1 H_2O waste

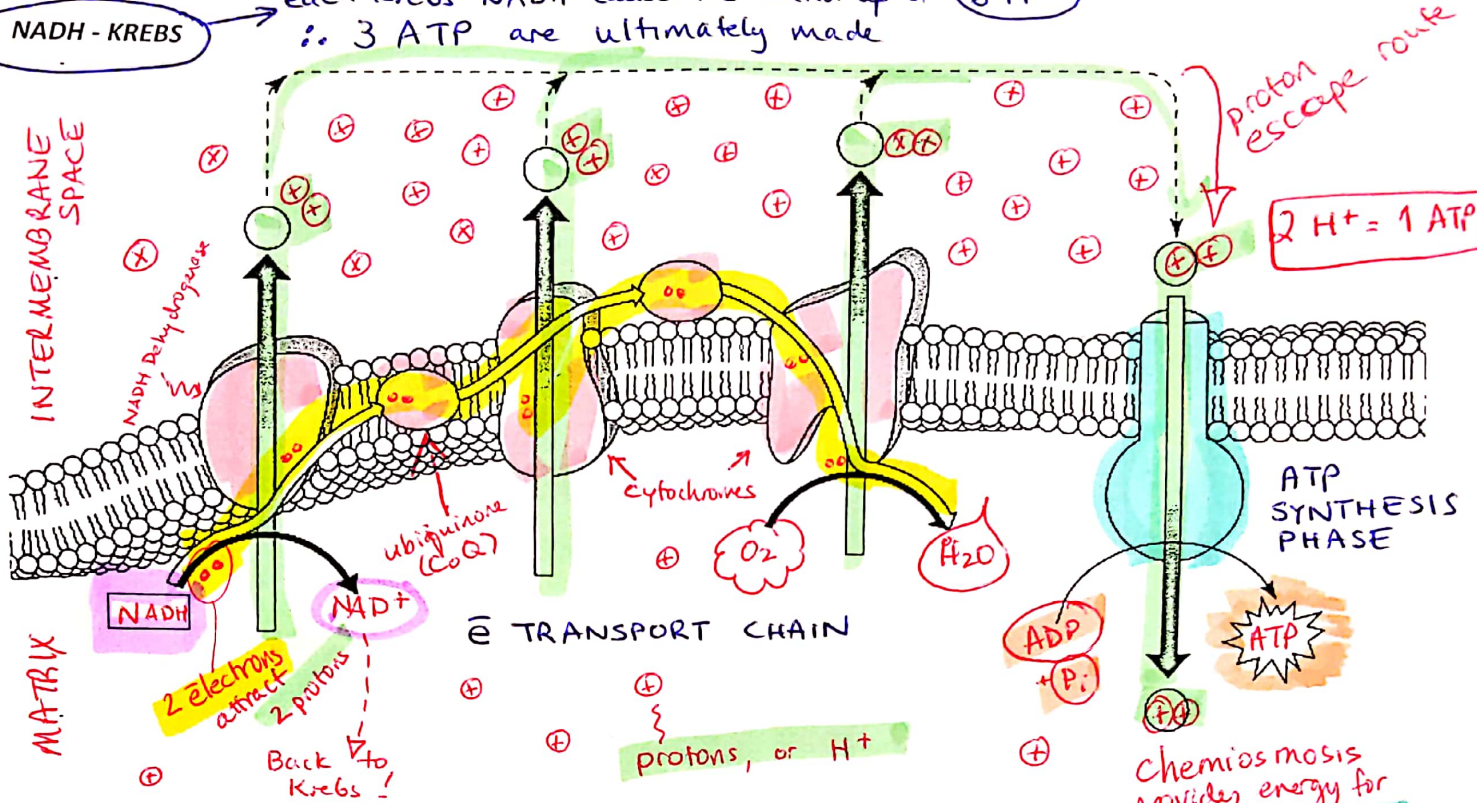


SBI4U Oxidative Phosphorylation - the final stage of cell metabolism

Oxidative - because it involves the release of electrons from NADH and FADH_2 , and their transfer down a series of proteins called the Electron Transport Chain.

Phosphorylation - because the energy of these electrons drives the production of ATP.

each Krebs NADH causes the build up of 6H^+
 $\therefore 3 \text{ATP}$ are ultimately made



FADH_2 - KREBS or NADH from Glycolysis

