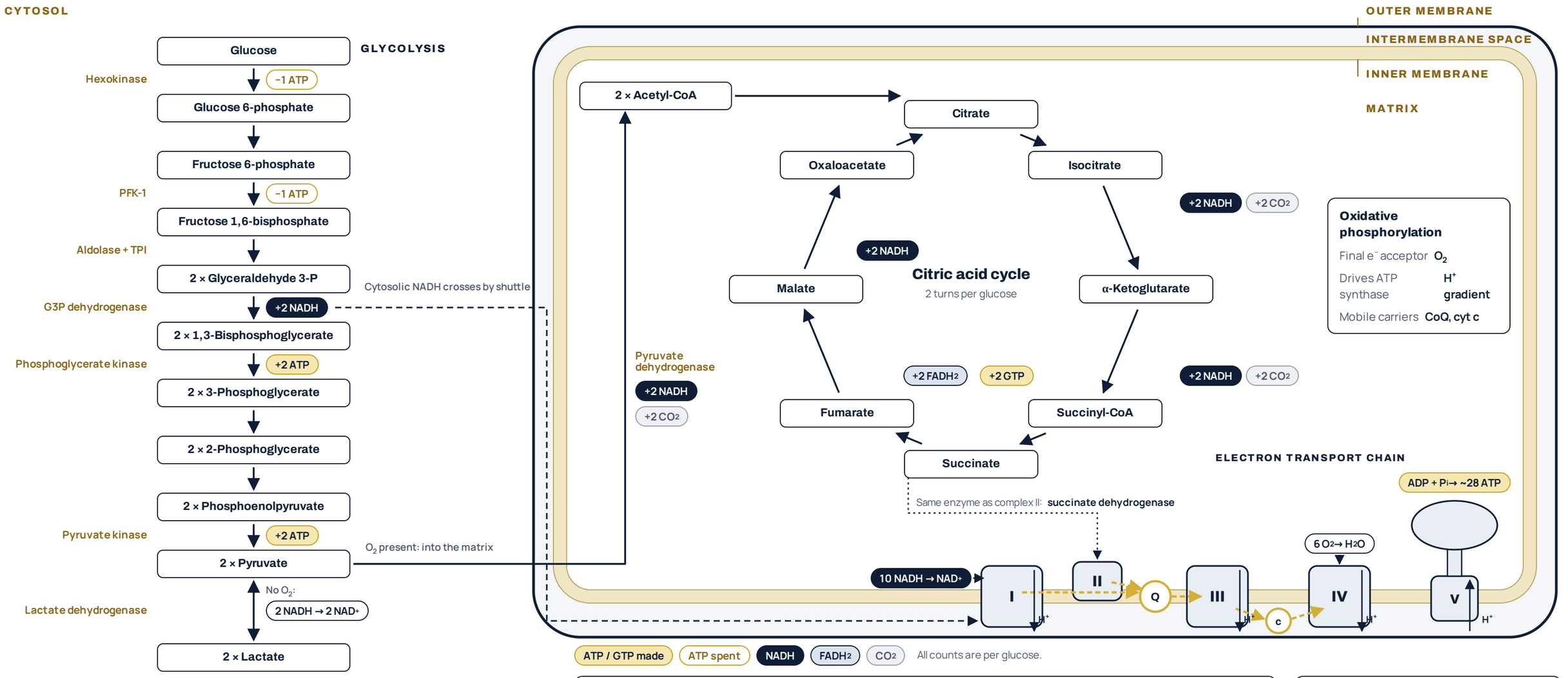
The Big Picture ANSWER KEY

SweetLion Prep

Name _____ Date _____



ATP / GTP made | ATP spent | NADH | $FADH_2$ | CO_2 | All counts are per glucose.

Stage	Location	ATP / GTP made directly	NADH	$FADH_2$	CO_2
Glycolysis	Cytosol	2 (net)	2	0	0
Pyruvate → acetyl-CoA	Matrix	0	2	0	2
Citric acid cycle (2 turns)	Matrix	2 (GTP)	6	2	4
Total per glucose		**4**	**10**	**2**	**6**

Connect the pathways

Why make lactate without O_2? **regenerates NAD^+ for GAPDH**

Two NADH shuttles **malate–aspartate, glycerol 3-phosphate**

Pyruvate's link to the TCA cycle **PDH makes acetyl-CoA**

What stops if O_2 runs out? **ETC, then TCA and PDH (no NAD^+)**

Where glucose's 6 carbons end up **6 CO_2 (2 from PDH, 4 from TCA)**

Cash it in at the ETC

NADH × 2.5 = **25 ATP**

$FADH_2$ × 1.5 = **3 ATP**

+ direct ATP / GTP = **4**

Total **~32 ATP**

With G3P shuttle **~30 ATP**

O_2 used per glucose **6**

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