

E! Canasta

energizing ATP's synthesis



Set up:

- 81 cards
 - 4 suits (Glycolysis, Krebs, Acetyl-CoA, ETC)
 - Special effect cards
 - Jokers
- 1 Points chart per duo
- 1 Card interactions chart per player
- 1 Sheet with the card sequences in the suits (Melds) for ATP synthesis.

Rules

- 1 – Set teams and organize yourselves between 4 to 6 players, with each duo sitting on opposing sides;
- 2 – Shuffle cards;
- 3 – Allow the player to the right to cut the deck (No more than 2 times);
- 4 – Distribute 10 cards face down for each player in a clockwise fashion;
- 5 – Wait for a few minutes until all players get their own cards arranged;
- 6 – Start the game from whoever first received the cards and carry on clockwise;
- 7 – The player will have up to one minute to perform his turn, if time passes, the player will lose 10 points;
- 8 – A player may meld organized sequences of, at least, 3 cards (cards of special effect do not apply to meld the first set). The canasta may be natural (with a single suit), mixed or dirty (with a card from another suit that may be used as part of the set or using a joker, respectively);
- 9 – A player may use cards of special effect or any other that has an effect over their own sequences. Such cards may only start getting used if at least one of the duo has put down a meld of no less than three cards;
- 10 – If a player uses a special effect card incorrectly, the card is discarded and the player loses 50 points;
- 11 – If a player makes a meld of an incorrect sequence, they lose 10 points per card laid out wrong, in which they must return to his hand;
- 12 – If a player does not have a meld to put down or does not wish to do so, they must take a card from the stock or take the first card from the discard pile and discard themselves one card, finishing their turn. (Whenever a card is taken, one must be discarded);
- 13 – When played in duos, both players may add to their shared sets or play special effect cards that may apply both to their own game or their opponents, although following the turns sequence;
- 14 – A player may join or split sets of cards however they wish. For example, they may split the canasta in two sets to separate a card of negative effect, as long as each set has at least 3 cards;
- 15 – If the stock is depleted, the cards from the discard pile must be reshuffled to make up a new stock;
- 16 – The game may end in two ways:
 - i – When either of the players play all of their cards, leaving none in their hands (Going Out, bonus of 100 point to whoever goes out);
 - ii – When there are no more cards to be taken from the stock and none of the players can make any moves (in such case, no points are awarded).
- 17 – As the game ends, players must compute their points, paying attention to special effect cards (negative or positive), which can be checked on the sheet of card interactions, sequences and scoring.

Scoring Sheet – E! CANASTA

Players: _____ Class: _____ Total Points: _____

Points Earned

Canastas		Special Effect Cards		Going Out
Natural				
Dirty				
Mixed				
Royal				
Unfinished				

Lost Points

Time (-10 after 1 min)		Special Effect Cards		Wrong Moves (-10 per card)

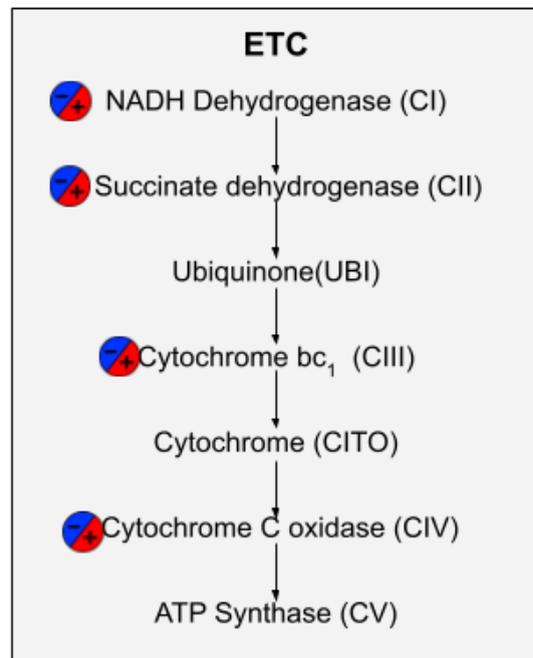
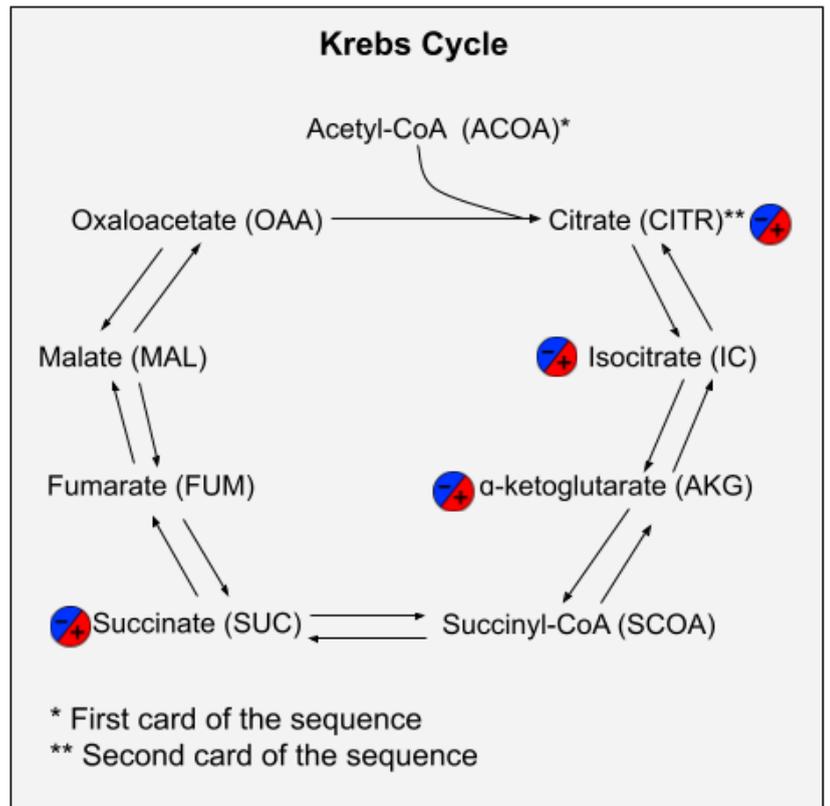
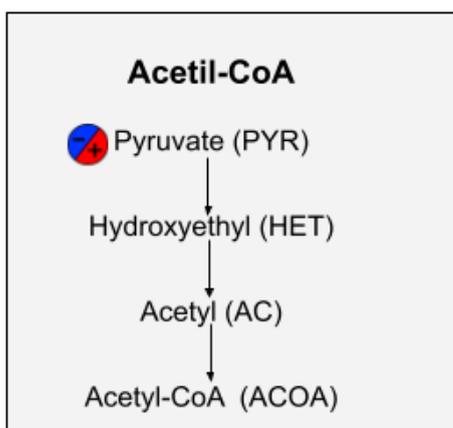
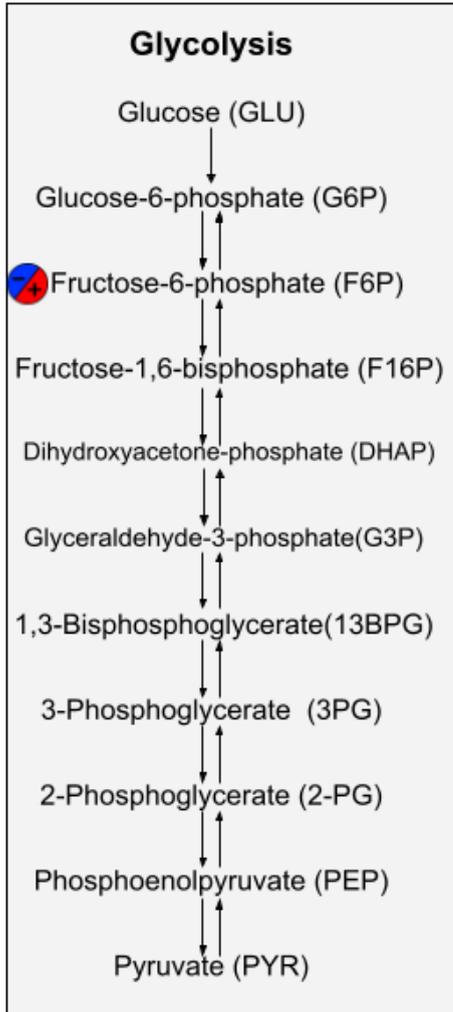
Canasta	Scoring
Natural Canasta (full set of the suit)	Glycolysis: 400 points; Krebs Cycle: 300; Acetyl-CoA synthesis: 100 points; ETC: 200
Royal Canasta (natural canasta + substance that precedes or succeeds the pathway):	Score of a natural canasta + 50 points per card chained.
Dirty Canasta (full pathway with a joker or card from another suit)	Glycolysis: 200 points; Krebs Cycle: 150; Acetyl-CoA synthesis: 75 points; ETC: 100
Mixed Canasta/Unfinished (only part of a pathway, with at least 3 cards, which may be part of the same suit or be a sequence between suits.	3 cards: 50 points; 4 cards 75 points; 5 cards or more 100



Card Interactions Chart

Card	Biochemical Context	Effects in-game - upon the indicated card			
		Positives		Negatives	
2,4-DNP	Decoupler	--	--	Any card from the ETC	-50
Acetyl-CoA	Pyruvate dehydrogenase complex	---	---	Pyruvate (Acetyl-CoA suit)	-20
ADP	Used by enzymes that synthesize ATP, which can work as a modulator of isocitrate dehydrogenase	1-3-Bisphosphoglycerate Phosphoenolpyruvate Isocitrate ATP-synthase	+20	---	---
Antimycin A	Acts upon complex III	---	---	Complex III	zeroes
ATP	Participates in phosphorylation reactions and may work as a negative modulator.	---	---	Fructose 6-phosphate α -Ketoglutarate Complex IV	-50
Barbiturate	Acts upon complex I	---	---	Complex I	-50
Cyanide (CN ⁻)	Acts upon complex IV	---	---	Complex IV	zeroes
Citrate	Phosphofructokinase 1	---	---	Fructose 6-phosphate	-20
Fructose-1,6-bisphosphate	Phosphofructokinase 1 Pyruvate kinase	Phosphoenolpyruvate	+10	---	---
Malonate	Acts upon complex II	---	---	Complex II	-100
NAD ⁺	Oxidized coenzyme, which may be used in oxy-reduction reactions	Glyceraldehyde 3-phosphate Isocitrate α -Ketoglutarate Malate	+20	---	---
NADH	Reduced coenzyme, which may be used upon complex I, while it may also inhibit some pathways	Complex I	+20	Pyruvate (Acetyl-CoA suit) Isocitrate α -Ketoglutarate	-50
Oxaloacetate	Succinate dehydrogenase	---	---	Succinate	-20
Pyruvate	Pyruvate dehydrogenase kinase / complex pyruvate dehydrogenase	Pyruvate (Acetyl-CoA suit)	+10	---	---
Rotenone	Acts upon complex I	---	---	Complex I	-50
Succinyl-CoA	Regulation of the α -ketoglutarate dehydrogenase complex	---	---	α -Ketoglutarate Citrate	-20

Card sequences inside suits (canastas) for ATP synthesis



Point of regulation/inhibition: look up chart of interactions for which cards may be used and the effects (+ or -).