

Biology Honors: Cell Respiration Posters

Name:

Period:

Legend:

_____ = Carbon compounds

_____ = Energy molecules

_____ = Waste products

Challenge: Create a poster that accurately shows the location and the steps for: glycolysis, intermediate steps, Krebs cycle, the light reactions, the Calvin cycle, and the electron transport chain. Use your notes, diagrams, or the textbook.

Follow the steps below:

Step 1: Using the entire piece of computer paper, draw a circle as your cell. Your paper will use both sides.

Step 2: Draw an oversized mitochondria and small chloroplast. Make sure the mitochondria covers $\frac{3}{4}$ of your cell since most processes will occur here.

- a. label the inner membrane
- b. label the outer membrane
- c. label the matrix

Step 3: Label the cytoplasm of the cell

Step 4: Draw the steps of glycolysis. Make sure you draw it in the correct location.

Step 5: Draw an arrow to show where the end product of glycolysis will go if oxygen is not available. Draw both fermentation pathways: alcoholic fermentation. Draw an arrow to show where the NAD⁺ regenerated in fermentation goes.

Step 6: Draw an arrow to show where the end product of glycolysis will go if oxygen is present.

Step 7: Draw the intermediate steps. Show what is released as waste. Show the reduction of NAD.

Step 8: Draw the Krebs cycle in the appropriate location. Be sure to show the reduction of NAD and FAD to form NADH and FADH₂. Show the various carbon compounds formed along the way. Show where ATP production occurs. Also show where CO₂ is lost.

Step 9: Draw arrows to show where the NADH and FADH₂ will go

Step 10: Draw the proteins embedded in the inner mitochondrial membrane. *in other words, draw the electron transport chain.

Step 11: Show what happens to the hydrogen and electrons that are delivered by NADH and FADH₂

Step 12: Show the electrons being passed down the chain. Draw and label oxygen. Label where H₂O is formed.

Step 13: Show the hydrogen ions (H⁺) that begin to build up. Where does this occur?

Step 14: Draw the (H⁺) slowly leaking back through the enzyme. ATP synthase (label this).

Step 15: Show how ADP + P becomes ATP

*Make sure you go back and color code all compounds listed above in your legend.

Step 16: Draw a circle on the back of your paper. Draw an oversized chloroplast and a small mitochondria. Make sure the chloroplast covers $\frac{3}{4}$ of your paper since most cell processes will occur here.

- a. Label the outer and inner membrane
- b. Label the granum
- c. Label the thylakoid
- d. Label the stroma

Step 17: Draw a large single thylakoid membrane. Sketch the light reaction on the thylakoid membrane.

Step 18: Show how light hits the photosystem II

Step 19: Draw how the electrons are passed through the electron transport chain.

Step 20: Label photosystem I. Show where the light hits it.

Step 21: Show how NADP⁺ becomes NADPH

Step 22: Draw all the steps of the Calvin cycle. Include where CO₂ is introduced

Step 23: Show where the ATP becomes ADP and where the NADPH becomes NADP

Step 24: Show where the H₂O enters and O₂ is released. Show where the CO₂ enters the chloroplast and what products are made from both the light and dark cycles.

* Go back and color code all compounds listed in your legend.

Step 25: Make a chart on your paper to show the totals below.

Glycolysis:		
ATP needed: _____	ATP made: _____	Net gain: _____
NADH produced: _____		

Intermediate:	
CO ₂ produced: _____	NADH: _____

Krebs cycle:	
CO ₂ produced: _____	
NADH produced: _____	
FADH ₂ produced: _____	
ATP produced: _____	

Electron transport chain:	
How many NADH delivered from Glycolysis, Intermediate, and Krebs? _____	
How many FADH ₂ delivered? _____	
Each NADH has enough potential energy to make 3 ATP.	
Each FADH ₂ has enough potential energy to make 2 ATP.	
Using the information above, how many TOTAL ATP can be formed in the electron transport chain? _____	