

# Cellular Metabolism: AP Biology

You have just returned from an amazing trip to the Summer 2016 Rio Olympics. You are reflecting back on all the tweets you made (and were retweeted) and photos you instagrammed over your 3 week trip. You begin to notice a pattern of all the high level of performances you were impressed with and begin to wonder-how do Olympic athletes do what they do, while still maintaining to function at a normal level in all other facets of their life?! This gives you an idea for your next edition of the up and coming science media outlet you are the editor for. You decide to investigate further into the key question: **How do athletes use free energy and molecular building blocks (such as carbohydrates, proteins, or lipids) to perform at high levels, while maintaining homeostasis?**

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You will be provided with the following resources to help focus your thinking to the connection between cellular metabolism and high performance of athletes.

- Performance and Endurance of Sports Article:  
[http://www.dialogues-cvm.com/document/DCVM63\\_04.pdf](http://www.dialogues-cvm.com/document/DCVM63_04.pdf)
- Metabolic Factors in Fatigue Article:  
<http://www.gssiweb.org/en/Article/sse-155-metabolic-factors-in-fatigue>

You are to use these resources, along with the information you gain from 3+ reliable resources, and your knowledge gained during the cellular metabolism unit to create a magazine, video blog, newspaper, or any other approved media outlet.

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## The goals of the media publication are to:

- analyze how cooperative interactions within organisms promote efficiency in the use of energy and matter
  - justify a scientific claim that free energy is required for living systems to maintain organization, to grow or to reproduce, but that multiple strategies exist in different living systems
  - construct explanations of the mechanisms and structural features of cells that allow organisms to capture, store or use free energy
  - communicate and solve scientific problems using representations and models
  - engage in scientific questioning to extend thinking to other disciplines
  - perform data analysis and evaluation of evidence.
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Project Due Date: \_\_\_\_\_

You will choose 1 box from each level 1, 2, and 3 to complete. You will complete all boxes from level 4. Levels 3 and 4 should refer directly to the focus question. Be creative in how you achieve each of the levels. In addition to the levels, each of you will be asked to comment on at least 2 of your peers work (as if you were writing into a media outlet).

Each level will have a checkpoint by which to complete the task. Checkpoints will be assigned by the teacher in advance, along with the final due date.

LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
MAP OF MITOCHONDRIA AND CYTOPLASM WITH "HISTORICAL" MARKERS	ANALYSIS OF ARTICLE RELATED TO CELLULAR RESPIRATION AND EVOLUTION	ENZYMES ROLE IN GLYCOLYSIS, KREBS CYCLE, OR ELECTRON TRANSPORT CHAIN	POINT OF VIEW FROM OXYGEN IN CELL RESPIRATION
DESTINATION AD FOR MITOCHONDRIA AND CYTOPLASM	CARTOON ILLUSTRATING EVOLUTION AS RELATED TO CELL RESPIRATION	ENZYMES ROLE IN DIGESTION	HOW IS ENERGY CAPTURED, STORED AND USED? (RELATE TO CELLULAR RESPIRATION)
OTHER CREATIVE ILLUSTRATIVE EXAMPLE FOR MITOCHONDRIA AND CYTOPLASM	LETTER TO THE EDITOR FOR HOW EVOLUTION RELATES TO CELLULAR RESPIRATION AND A RESPONSE.	ENZYME DISEASE OR ENZYME TREATMENT RELATED TO EFFECT ON CELLULAR PROCESSES	ENZYME LAB RESULTS

### CHECKPOINTS for LEVELS:

Level 1: \_\_\_\_\_

Level 2: \_\_\_\_\_

Level 3: \_\_\_\_\_

Level 4: \_\_\_\_\_