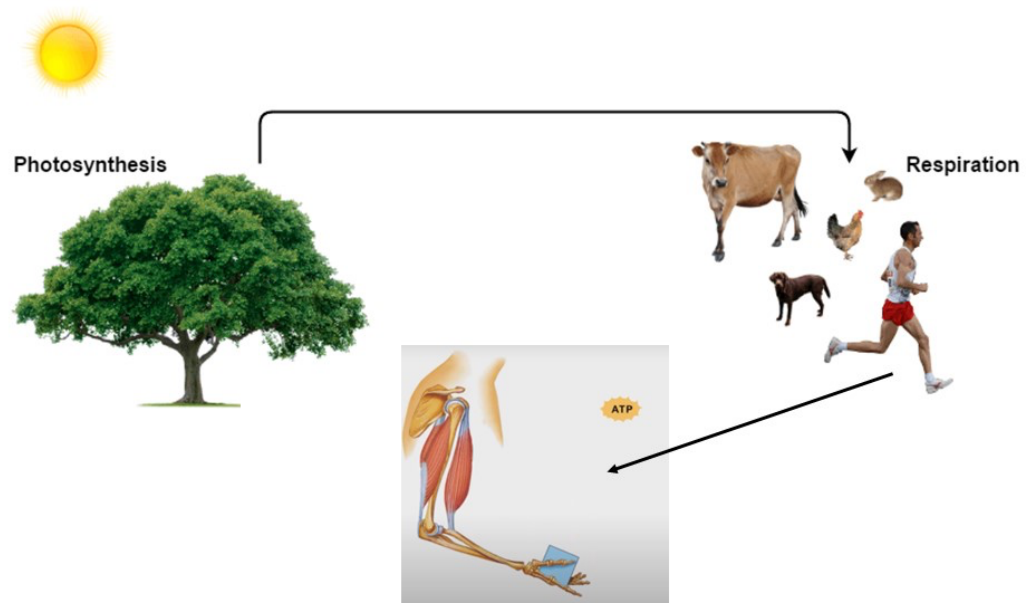


PAL worksheet: Metabolism II

Review Questions: Please DRAW a figure that answers each question.

1. To completely metabolize a molecule of glucose to its end products of carbon dioxide and water will yield \_\_\_\_\_ molecules of ATP and will \_\_\_\_\_ oxygen.
  - A. 36; require
  - B. 38; require
  - C. 2; not require
  - D. 38; not require
  - E. 36; not require
2. In a muscle cell used for steady activity over time (such as your calf muscles walking) you would expect to find \_\_\_\_\_ mitochondria and \_\_\_\_\_ capillaries. [Hint: recall that gases like oxygen and carbon dioxide are carried via the blood]
  - A. Many; many
  - B. Few; few
  - C. Many; few
  - D. Few; many
3. If there is insufficient delivery of oxygen to working tissues (Ex: intense running), which of these will occur?
  - A. glycolysis will cease
  - B. there will be an increased production of carbon dioxide and water
  - C. the last part of Kreb's cycle (the electron transport chain) will cease
  - D. pyruvic acid will no longer be able to enter Kreb's cycle
  - E. Two of these are correct.
4. If the scenario described in #3 (above) happens, which of these will occur as a result?
  - A. pyruvic acid will back up and stop glycolysis from occurring
  - B. pyruvic acid will convert into lactic acid
  - C. pyruvic acid will continue on into Kreb's cycle per usual
  - D. pyruvic acid will convert into glycogen to be stored as fuel
5. Which of these statements is INCORRECT?
  - A. Glycogen, which is simply stored glucose, may be broken down and used in glycolysis.
  - B. Fat (another stored fuel) may be broken down and used in glycolysis, but not in Kreb's cycle.
  - C. Amino acids (broken down from protein) may be inserted into Kreb's cycle at various points.
  - D. Efficient use of any fuel source requires oxygen.

- Someone with anemia has a low level of red blood cells, which help to transport oxygen from lungs to tissues. Explain in detail why this condition may lead to fatigue and a compromised (reduced) athletic performance.
- The picture below shows a muscle moving (which requires ATP), a runner, a plant, and the sun. Can you make the connection between the sun and the muscle movement?



- Successful athletes are some of the most celebrated people in the world. Why can't we all have a piece of this success? With a little bit more training... Brainstorm what could be the limiting factors preventing most people to perform like professional athletes. Focus on skeletal muscle, what it needs to perform, and how that is being delivered. Include organs helping with this.