*Muscle Energy Metabolic Pathways*

1. There are three key nutrients for muscle activity.
   1. What are the three energy nutrients?
   2. Which molecule is the main source for energy in the body?
   3. What is the difference between glucose and glycogen?
   4. How does the amount of used carbohydrate and fat change as the length of the activity changes?
2. ATP
   1. Describe the function of the ATP molecule in a muscle fiber. (There are two that should come to mind.)
3. Energy Pathway #1
   1. What is the function of creatine phosphate?
   2. How long does it last?
   3. What types of activities use this pathway?
   4. How long does it take to regenerate?
   5. How many ATP are produced?
4. Energy Pathway #2
   1. How long does it last?
   2. What types of activities use this pathway?
   3. What is the end product?
      1. There are 2 possible pathways for this molecule. What are they?
      2. What determines which pathway is used?
   4. What is lactic acid?
   5. How long does it take to regenerate this pathway?
5. Energy Pathway #3
   1. What is cellular respiration?
      1. What are the three parts of cellular respiration?
      2. Where do each of these occur within the cell?
      3. How much ATP is produced?
   2. What types of nutrients can be metabolized in this process?
   3. How long does it last?
   4. What types of activities use this pathway?
6. Application/Extenstion
   1. What is muscle fiber recruitment?
      1. Is this determined by the energy pathway used? Explain.
   2. Why is a ‘cool down’ necessary after intense muscle activity?
      1. What is being metabolized? Regenerated?
   3. There are lots of diets out, each with the goal of modifying our metabolism.
      1. What advantages and disadvantages are there to using fats as a fuel source?
      2. Why is protein not an often used fuel source?
         1. In what types of activities is it used? Explain.
         2. What is the downside of excess protein consumption?

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| **Energy System** | **Creatine Phosphate** | **Lactic Acid** | **Cellular Respiration** |
| Location of process |  |  |  |
| Energy source(s) |  |  |  |
| Oxygen required? |  |  |  |
| ATP generated |  |  |  |
| Maximum work time |  |  |  |
| Lactic acid produced |  |  |  |
| Type of activities |  |  |  |
| Advantage |  |  |  |
| Limitation |  |  |  |