



# Muscle Fatigue ... Weight Lifting

Your muscles need *Glycogen* (muscle sugar) in order to function. When the glycogen is broken down into energy for the muscles a waste product called *lactic acid* is produced. A buildup of lactic acid decreases the muscles' ability to contract and *Muscle Fatigue* sets in.

## Do this:

Hold a book in each hand.  
Raise one arm straight out parallel to the ground and the other arm down at your side.



## Muscle Fatigue ... Weight Lifting

How long did you hold the book before fatigue got the better of you?

\_\_\_\_\_ minutes \_\_\_\_\_ seconds

Which arm felt the fatigue the most?     straight arm     arm by your side

Which muscles experienced the most fatigue?

biceps     triceps     deltoids     pectoralis major

# Muscle Fatigue ... Too Tired to Sit



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## Do this:

Sit against the wall with your knees bent at a  $90^{\circ}$  angle. Hold this position for as long as it takes to feel muscle fatigue.



(If it's been more than 3 minutes you ain't doin' it right).

## Muscle Fatigue ... Too Tired to Sit

How long did you sit before your legs started to burn like crazy?

\_\_\_\_\_ minutes \_\_\_\_\_ seconds

How did it feel to try to walk right after sitting against the wall?

The funny feeling in your legs is called *muscle fatigue*. Fatigue is caused by a buildup of

\_\_\_\_\_ in the muscle.

# Activity

## Skeletal and Muscular Systems

### Muscle Fatigue

Anyone who has performed strenuous exercise knows that muscles can soon begin to ache, or show fatigue. In this activity you will examine how quickly some of your muscles begin to tire.

Rest your elbow on the desk so that the palm of your hand is facing toward you. Open and close your hand forcefully as many times as you can in 30 seconds. Repeat four more times, each time recording your results in the Data Table.

Stand up. Hold a book in your hand with your arm positioned straight down at your side. Keeping your arm straight, lift the book to shoulder height. Then lower it. Count the number of times you can raise and lower your arm in 30 seconds. Repeat four more times and record your results in the Data Table.

**DATA TABLE**

Trial	Number of Fists Made	Number of Arm Lifts
1		
2		
3		
4		
5		

- (2) 1. What conclusions can you draw from your results? \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

(50) You may want to obtain results for <sup>10</sup> ~~10~~ other class members or friends. On a sheet of graph paper, graph these results using a different colored pencil to represent each individual. Also make a data table of your data and your 10 classmates.

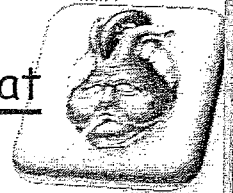
2. Are there any differences? Might they be related to age, sex, or the physical fitness of the individual? \_\_\_\_\_

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## Muscle Fatigue ... To Beat or Not to Beat

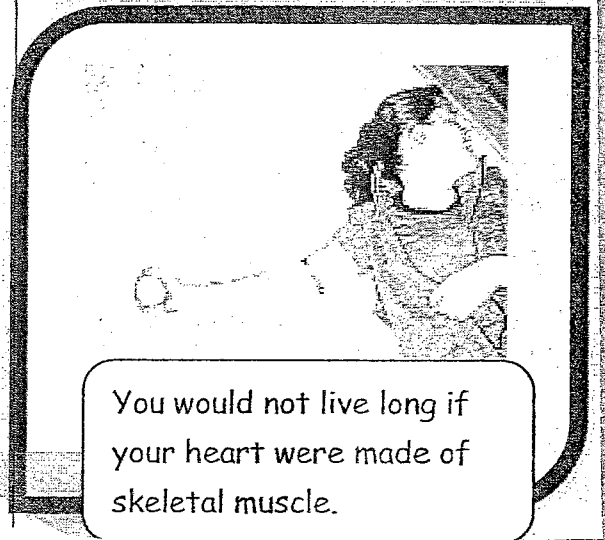


Your heart is made up of a very special type of muscle called **Cardiac Muscle**. It keeps working hard from before the day you are born until the moment of your death. It never gets needs to stop and rest like your skeletal muscles do. Cardiac muscle does not experience muscle fatigue but skeletal muscles do. Here we will compare cardiac and skeletal muscles with the help of your strong arm and a "tennis ball heart".

## Muscle Fatigue ... To Beat or Not to Beat

How is your heart (cardiac) muscle different from your arm (skeletal) muscle? (just compare how tired your arm got doing the work of the heart)

Does cardiac muscle experience fatigue?  
Does skeletal muscle experience fatigue?



You would not live long if your heart were made of skeletal muscle.