

BONES, MUSCLES, HEART AND LUNGS

BONES

The skeleton has 3 functions

1. Support (holds up your body)
2. Protection(protects your vital organs)
3. Movement(joints allow you to move)

Cartilage makes a cushion between 2 bones

Ligaments are very strong and join bones together

Tendons attach bones to muscles

2 types of moveable joint that you need to know about

1. Ball and socket eg your shoulder
 - This joint can move in all directions(flexion,extension,rotation,adduction,abduction)
 - Is also known as a SYNOVIAL JOINT
2. Hinge joint eg your knee
 - This joint can only move back and forwards(flexion and extension)

Keeping your bones healthy is easy

- Exercise makes your bones stronger
- Exercise strengthens your ligaments and tendons
- Weight bearing exercise such as jogging is the best exercise of all
- Calcium keeps your bones healthy

Bone injuries could include

- Fractures(green stick, simple, stress, compound)
- Joint injuries might include

MUSCLES

Check out the names of all your muscles !!!!

Muscles work in pairs. ANTAGONISTIC.

- One muscle contracts(shortens) whilst the other one relaxes(Lengthens)
- The contracting muscle is called the *prime mover* or *agonist*
- The relaxing muscle is called the *antagonist*
- Each muscle is attached to 2 bones
- Only 1 of the bones connected at the joint actually moves

Exercise strengthens muscles

Short term effects

2 types of contraction

- **ISOMETRIC...** Muscles contract but there is no visible movement eg a ski sit held against the wall
- **ISOTONIC...** Muscles contract and there is visible movement eg repeated press ups

If your body cannot keep up with the muscles demand for oxygen, they will work anaerobically and **LACTIC ACID** will build up

Long term effects

Regular exercise makes muscles thicker (hypertrophy)

Thicker muscles are stronger

Remember that your heart is a muscle too.

Muscles need to rest and recover so that you do not over train and injure yourself

A diet rich in **PROTEIN** will speed up the rate your body repairs and rebuilds your muscles

STEROIDS stimulate the body to build muscles. They are illegal.

HEART

- The Cardio vascular system is made up of **HEART, BLOOD AND BLOOD VESSELS**(arteries...away from the heart.....Veins towards the heart)
- The CV system transports oxygen and nutrients around the body
- The Cardio vascular system has a double circuit. It goes through the heart twice (once through each side)

The body circuit carries oxygen to the body in arteries **FROM THE LUNGS**. Deoxygenated blood is carried in the veins.

The **BODY** circuit carries deoxygenated blood from the heart **TO THE LUNGS** to be oxygenated.

Heart rate = number of times your heart beats per minute

Stroke volume = amount of blood that each ventricle pumps with each heart beat

CARDIAC OUTPUT = STROKE VOLUME X HEART RATE

SHORT TERM EFFECTS OF EXERCISE

- Heart rate increases
- Heart contracts more strongly
- Blood pressure increases

LONG TERM EFFECTS OF EXERCISE

- Heart gets bigger and stronger
- Stroke volume and Cardiac out put will increase
- Resting heart rate will decrease
- Veins and arteries get bigger and stretchier

- You can recover from exercise quicker

Your lifestyle affects your cardiovascular system....

- Diet can cause high blood pressure and cholesterol levels go up
- Drugs such as alcohol and smoking will increase your blood pressure which is bad !!!!!

LUNGS

The respiratory system passes the air we breathe to our lungs

- Nose
- Trachea
- Bronchi
- Bronchioles
- Alveoli

Gas exchange takes place in the alveoli....the blood exchanges carbon dioxide from the working muscles with oxygen to replace supplies

Vital capacity is the most air that you can breathe in or out in one breath. This will improve with exercise

SHORT TERM EFFECTS OF EXERCISE

- You breathe quicker
- You breathe more deeply
- Lactic acid will build up during anaerobic activity
- You will need to repay the oxygen debt once you have stopped exercising therefore you breathe heavily for a while after exercising

LONG TERM EFFECTS OF EXERCISE

- Muscles around your chest get stronger so that the chest cavity can get bigger
- This means that you can breathe in more air **VITAL CAPACITY INCREASES**
- More oxygen gets to your muscles per breath
- So you can exercise for longer

Your lifestyle affects your respiratory system....

- Smoking clogs up your alveoli with tar so the lungs are less efficient
- Smoking can cause cancer and emphysema
- Nicotine is addictive and makes it hard to stop