THE EFFECTS OF EXERCISE

ALL MUST—know and understand the basic short and long term effects of exercise on the different body systems

MOST SHOULD—be able to describe the short and long term effects of exercise

SOME MIGHT—be able to explain the effects and identify links/relationships
White board task

**Task 1**
What do you think is meant by the following terms:
1. Blood pressure
2. Heart rate
3. Stroke volume
4. Cardiac output

**Extension**
How do you think the 3 might be linked?
What is Blood pressure?

Blood pressure – how hard the heart is working to push blood through the vessels.

Normal blood pressure is 120/80 at rest.

What factors might affect an individual’s blood pressure?

Age.  
Gender  
Stress  
Diet  
Exercise
Heart rate is the number of times your heart beats every minute. Measured in beats per minute (b.p.m).

Stroke volume is the amount of blood pumped out of the ventricles per beat.

Cardiac output is the amount of blood pumped out of the ventricles of the heart per minute.

Cardiac output can be calculated by multiplying the stroke volume by the heart rate:

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\text{cardiac output} = \text{stroke volume} \times \text{heart rate}
\]
Video task - revision

Focus on:

- Resting heart rate
- Recovery rate

http://www.bbc.co.uk/schools/gcsebitesize/pe/appliedanatomy/circulatory/0_anatomy_circulatorysys_act.shtml
Unfit, Average, trained performer

Comparing the efficiency of the heart for different performers.

**White board task.**

1. How might their resting heart rates differ?
2. How might recovery rate differ?
3. How might stroke volume and cardiac output differ?
Effects of exercise on the body systems

When we start to exercise many changes occur within each body system. These are called the short term or immediate effects of exercise.

Changes or adaptations will also occur in each body system if we exercise regularly or train over a period of time e.g. weeks/months. These are called the long term effects of exercise.
Short term effects of exercise circulatory

**Circulatory system**

To keep the body supplied with what it needs, during exercise the heart beats **faster** and with **greater force**.

This means that the **heart rate** and **stroke volume** increase.

What do you think happens to the **cardiac output**?

**Blood pressure** increases so the blood flows faster

**Increase** in the **amount of oxygen** delivered to the working muscles

**Vasodilation** occurs in vessels leading to the muscles (widening of the vessels to allow more blood through)

**Vasoconstriction** (narrowing) of the vessels leading to the organs e.g. stomach
**Short term effects of exercise - respiration**

**Muscular system**
- Increase in *respiration* at the working muscles
- More O2 and glucose are used

**Respiratory system**
- Increase in breathing rate and tidal volume

**Other effects**
- Body temperature increases
- Blood flow to the skin increases
- Skin becomes hot
- Sweating increases
Long term benefits of exercise

Circulatory system

- The heart gets larger (hypertrophy)
- The muscular wall becomes thicker and stronger
- Stroke volume at rest increases, leading to a lower resting heart rate.

Additionally:

1. Increase in red blood cells
2. Quicker recovery rate following exercise
3. Lowered blood pressure
4. Higher stroke volume = increased Cardiac Output
Long term benefits of exercise

Respiratory system
• Diaphragm and intercostal muscles get stronger
• Increase in capillaries around the alveoli
• Faster gaseous exchange
• Increase in vital capacity (amount you breath in)

Skeletal and muscular systems
• Muscles use O2 more efficiently
• Increase in capillaries around the muscles
• Larger & stronger muscles (hypertrophy)
• Bones, Ligaments and Tendons get stronger